

## Next Week: Datapro's Software Survey

# COMPUTERWORLD

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## SPECIAL REPORT

Inside —  
DBMS: Weighing  
The Options



### Inside

IBM gave its blessing to the much-touted micro-to-mainframe link with its recent announcement of the 3270/Personal Computer and Personal Computer XT/3270. Users will be the big winners. Page 2.

Closing the last chapter in the celebrated high-technology espionage case, Mitsubishi Electric Corp. pleaded no contest to charges it conspired to receive stolen IBM trade secrets. Page 4.

If sales are up 16%, why are Digital Equipment, Corp.'s first-quarter earnings the worst the company has posted in seven years? Page 4.

Apollo Computer, Inc. has increased its line of 32-bit scientific workstations with two units that use proprietary Apollo chips. The vendor also linked its users to Ethernet-based networks. Page 5.

Compaq Computer Corp. started playing hardball in the transportable computer market last week by introducing a system that is compatible with IBM's Personal Computer XT and features a built-in 10M-byte Winchester hard disk system. Page 6.

Eagle Computer, Inc. also unwrapped a hard disk-based portable system that is compatible with both IBM personal computers. Page 75.

A voice mail system that can facilitate both internal and external communications and plugs into existing digital switching equipment has been unveiled by Centigram Corp. Page 71.

Short-term needs and the fear of machine obsolescence are forcing more users to take out new leases on the lives of their micros rather than buy systems. Micro rentals are also on the upswing, according to a number of leasing firms. Page 91.

## Industry Giants Preview Own Local-Area Networks

•AT&T Won't Sell Net •IBM Token Ring Net Directly to End Users Not Yet on Market

By Phil Hirsch

CW Washington Bureau

GENEVA, Switzerland — Western Electric will begin marketing next January a local-area network developed by Bell Laboratories. AT&T Chairman Charles L. Brown revealed at a press conference here last week. However, AT&T will not market the network directly to end users.

Instead, Western Electric, AT&T's manufacturing arm, will sell the network to telephone operating companies, which then will market it to end users.

Although he was reluctant to provide detailed specifications for the network, Brown said it would utilize both fiber-optic and coaxial cable. The network does not require a particular transmission protocol, he added, so users will be spared the related code conversion costs.

A version of the local-area network, which reportedly will be called 3Bnet, is currently installed in Florida's Dade County, where it connects a number of Southern Bell Telephone Co. switching centers, Brown said. Its first installation outside the telephone net-

(Continued on Page 10)

By Phil Hirsch

CW Washington Bureau

GENEVA, Switzerland — IBM displayed its much-anticipated local-area network at an international telecommunications conference here last week, but company officials refused to say when — or if — it would be offered commercially.

Although the token ring network transmits digital voice signals, "it's not a private automated branch exchange," noted an IBM technician who asked not to be identified. Much more work is needed before real-time voice conversations can be handled as well as the telephone network handles them, he said, but noted that the network accommodates stored voice applications.

Scientists at IBM's Zurich laboratory, where much of the development work was done, are now working on a 16M bit/sec version of the network, he added. The model shown at Telecom '83 has a nominal speed of 4M bit/sec, but the technician acknowledged that the actual throughput is "considerably less."

Even so, IBM's new token ring network (Continued on Page 10)

## Software Lets PE Superminis Run in SNA, X.25 and BSC Nets

OCEANPORT, N.J. — Perkin-Elmer Corp. today unwrapped a set of communications products that make its Series 3200 line of 32-bit superminicomputers compatible with IBM's Systems Network Architecture, Ansi's X.25 and other IBM-supported protocols.

The products, collectively dubbed "Pengates" for networking gateways, reportedly permit 3200 systems and peripherals to access data bases and applications programs stored on IBM processors for either interactive or batch jobs. Today's introductions include:

• Pennet Plus Open Systems Network, a general-purpose, open networking environment that provides both wide-area networking via X.25 and local-area

Besides the Pengates, Perkin-Elmer Corp. also announced today:

• Software that can tie two Series 3200 superminis into a full-safe system and marks PE's first foray into the fault-tolerant market. Page 7.

• Fortran VII and C compilers that serve as "bridge products" between PE's Unix look-alike operating system and its OS/32 real-time operating system. The compilers represent PE's first step toward language products that can be used in any PE operating environment. Page 7.

• Network Electronic Mail (NEM/32), which works with Pennet Plus and lets users transmit information to multiple computer systems. Page 6.

networking via Xerox Corp.'s Ethernet.

• SNA Gateways, which provide connections to SNA networks and emulation of IBM 3270 and 3270 devices and workstations.

• Biscynchronous Communications (BSC) Gateways, to

connect with bisynchronous-based and other computer systems, peripherals and communications lines.

Pennet Plus follows the International Standards Organization's Open Systems Interconnection model. It al-

(Continued on Page 6)



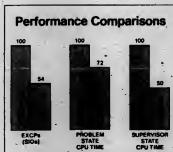
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## Mitsubishi Pleads No Contest To Trade Secret Theft Charges

By Jeffrey Beeher

CW West Coast Bureau  
SAN FRANCISCO — The second of two Japanese electronics vendors charged last year with conspiring to steal IBM trade secrets has pleaded no contest to the criminal charges against it.

In the wake of the plea, which was entered Oct. 20 before U.S. District Court Judge William Ingram, Mitsubishi Electric Corp. received a \$10,000 fine, the maximum penalty under federal law.

Also ordered by Ingram to pay \$10,000 fines were Mitsubishi employees Kazuma Ban and Takaya Ishida, both of whom pleaded guilty to charges of conspiring to transport stolen IBM technology.

In pleading no contest rather than guilty, Mitsubishi stopped short of admitting any wrongdoing in the trade-secrets theft case, but nonetheless left itself open to criminal penalties.

Mitsubishi's plea effectively closes the last major chapter of a widely publicized espionage case that first grabbed front-page headlines in June 1982, when the Federal Bureau of Investigation accused the company of paying \$26,000 to obtain stolen, highly confidential IBM technology. Other defendants charged in connection with the industrial-spying

case include a second Japanese electronics manufacturer, Hitachi Ltd., and more than 20 Mitsubishi and Hitachi employees or suspected agents.

Together, the two Tokyo-based vendors reportedly paid federal undercover investigators nearly \$650,000 in a clandestine effort to acquire sensitive documents describing IBM's 370 Extended Architecture, 3080 hardware designs and MVS/SP Version 2.0 source code.

Last February, Hitachi pleaded guilty to one criminal count of conspiring to transport stolen property and received the maximum penalty from U.S. District Judge Spencer Williams.

On Sept. 16, 1982, IBM filed a civil suit against Hitachi and its two U.S. business partners, National Semiconductor Corp. and National Advanced Systems Corp. The suit's main aim was to prevent the defendants from using the stolen IBM trade secrets in their future products.

Slightly more than a year later, however, IBM and Hitachi settled the civil suit out of court. Under the settlement, IBM has gained the five-year right to scrutinize all its Japanese competitors' new products before they are introduced.

## DEC Earnings Plunge 72%; Analysts Ponder Reasons

By Bill Luber

CW Staff

MAYNARD, Mass. — Digital Equipment Corp. last week made its poorest financial showing in seven years when it posted first-quarter earnings that plunged 72% below those of the year-ago quarter.

The report came as no surprise. DEC had announced the week before that first-quarter earnings would be lower than projected, and the announcement caused the price of its stock to plummet [CW, Oct. 24].

Earnings for the first quarter were \$15.9 million, or 28 cents per share. However, sales rose 16% to \$1.07 billion, compared with \$927 million a year earlier.

The 16% gain in sales was a bright spot in an otherwise gloomy set of figures. However, this bit of good news served to frustrate and confound further analysts end DEC watchers struggling to understand why No. 2 computer maker fell so suddenly into a fiscal rut.

"That magnitude of revenue gain means there are plenty of machines going out the door and therefore plenty of money coming in. The question is where the hell's the money going if it's not showing up on the bottom line," one analyst said.

DEC stunned Wall Street two weeks ago when it revealed the anticipated quarterly earnings. As early as the week before doing so, the company had indicated to investors that earnings for the quarter would be flat — about \$55 million, or \$1 per share. DEC's stock dropped precipitously in the days following the earnings estimate, losing one-third of its market value in furious trading.

Since that time, analysts have tried to piece together the reasons for DEC's startling decline; the company has offered little in the way of a plausible explanation. "While revenues grew 16%, this rate of growth was below our expectations due principally to lower than planned personal computer product shipments and the delay in shipment of certain products," said Alfred M. Bertocchi, vice-president of finance and administration.

However, DEC now derives little of its total revenues end earnings from personal computer sales. The firm had planned to ship about 25,000 personal computers per quarter in its fiscal year beginning July 1. However, in the first quarter the firm reportedly sold only 19,000 units, falling nearly 6,000 units short of its intended goal.

"This [personal computer] impact has been overstated by the company," said Frederic G. Withington, industry analyst with Arthur D. Little, Inc. in Cambridge, Mass. "The [personal computer] market is not really all that big for DEC."

DEC's Bertocchi also alluded to problems in implementing the companywide reorganization begun a year ago to make the company more responsive, market-driven force. The ongoing reorganization will replace DEC's product groups with market groups.

When he commented on the quarter results, Bertocchi said, "There were also temporary problems

caused by changes in the company's administrative systems," an estimation not made when earnings estimates were made public two weeks ago.

Withington said the earnings plunge more likely indicates "ell sorts of confusion on the administrative level." He speculated that DEC may have decided at the last minute to write off certain projects that are canceled, similar to what Burroughs Corp. Chairman W. Michael Blumenthal did when he took control of that company two years ago.

Withington hypothesized that the reorganization could have turned up recurring costs that were never registered under the old product group arrangement. If this is the case, he said, DEC's relatively low earnings reported this quarter may become the rule and not the exception.

"I'm not too surprised at what's happened," Withington said. "We've been saying for some time that DEC has been getting technologically fat and lazy."

Stephen K. Smith, financial analyst at Paine Webber Mitchell Hutchins, Inc. in New York, said the atmosphere on Wall Street could be characterized as one of betrayal the week following DEC's earnings estimate.

Smith attributed the sharp earnings decline to DEC's selling many products with low profit margins, such as its VAX-11/780 supermini-computer.

But, Smith added, there is "great concern" on Wall Street about management's credibility. "One would have to say it is difficult to explain how management could not know just how bad things would be on the earnings side. ... DEC will travel a very rocky road over the next six months or so."

## Year Earnings Dip 6.5% at DG

WESTBORO, Mass. — Citing moderate but already improvements in orders, Data General Corp. last week reported fourth-quarter earnings of \$10.7 million, or 86 cents per share, compared with \$600,000, or 5 cents per share, in the same period one year ago. Sales in the quarter rose 8% to \$272 million.

For the year ended Sept. 24, however, DG's earnings were down 6.5% to \$23 million, or \$1.93 per share, compared with \$24.7 million, or \$2.28 per share, a year earlier.

Commenting on the results, Edson deCastro, company president, said DG's bottom line was bolstered in the fourth quarter by interest in the MV/10000, the supermini-computer introduced last spring. Further, deCastro said that DG has begun shipments of its Desktop Generation microcomputer systems, announced last summer.

The company also announced a two-for-one stock split in the form of a 100% stock dividend on its common stock, payable Nov. 18. This action will effectively double the number of outstanding shares to 22.6 million.

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Also Offers Ethernet Access:

# Apollo Caps 32-Bit Scientific Workstation Line

By Tom Henkel  
CW Staff

BOSTON — Apollo Computer, Inc. last week added two high-end systems to its 32-bit line of scientific processor/workstations, both of which operate with the firm's Domain local-area network.

At a press conference here, the firm also announced:

- A networking gateway that reportedly allows Apollo users to connect their systems to Ethernet-based local-area networks, allowing communications outside the firm's proprietary Domain network.

- Domain Professional Support Services and the Domain Software Engineering Environment, which allow scientific and engineering users of Apollo systems to perform administrative functions concurrently with scientific applications (story below).

- A Domain server processor, the

DSP160, which offers accelerated calculation and high-speed memory. The unit was designed to improve performance for computation-intensive applications conducted on the Domain network.

## Perform Like VAXs

The DN460 and DN660 processors introduced last week as high-end additions to the Apollo workstation family are said to offer roughly the same performance as Digital Equipment Corp.'s VAX-11/780 superminicomputer. The processors are identical, except the DN460 offers a monochrome display and the DN660 features a color display.

Both processors mark a departure in the firm's use of Motorola Inc.'s 68000 microprocessor chip in favor of its own proprietary 32-bit chip. However, the proprietary chip is compatible with 68000-based applications, noted Apollo's vice president of marketing, Edward J. Zander. The chip reportedly boosts the systems' internal performance to the equivalent of a VAX-11/780 supermini. The processors perform at approximately 1.2 million instructions per second, about a three-fold increase over Apollo's earlier high-end processors, the DN420 and DN600, the vendor said.

The two processors feature up to

4M bytes of main memory and a virtual address space of up to 256M bytes. Each is housed in a 10-slot chassis. An optional five-slot chassis is available as an add-on for users who want to use Intel Corp. Multibus boards.

The DN460, with 1M byte of main memory, a 19-in. 800- by 1,024-pixel bit-mapped monochromatic graphics display, three asynchronous I/O ports, an integrated hardware floating-point processor, detachable keyboard, local-area network interface and a license to use the firm's networkwide virtual memory operating system, costs \$39,500.

(Continued on Page 6)

## Curriculum Update 2 Second in a Series

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## Programs Ease Paperwork For Tech Staff

BOSTON — With an eye toward helping administratively burdened technical people, Apollo Computer, Inc. last week announced two software programs that allow users to run technical and management applications simultaneously and to catch up on their paperwork.

Announced at a press conference here, the two programs, which operate on Apollo's Domain local-area network, are Domain Software Engineering Environment (DSEE) and Domain Professional Support Services (DPSS).

DSEE is a set of four integrated interactive functions: history management, which allows users to keep and manage a history of past versions of multiple software modules; configuration management, which integrates modules into software systems; advice management, which tracks dependencies and allows new software engineers to build on their co-workers' past experiences; and task management, which relates the work of an individual engineer to a firm's organizational goals, Apollo said.

All four functions operate in conjunction with Domain's Fortran 77, Pascal or C language compilers.

DSEE costs \$1,500 per processor node on the Domain network.

DPSS consists of five administrative tools: DPSS/Document, a structured document editor; DPSS/Mail, a Domain-wide electronic mail package; DPSS/File, a document storage and retrieval program; DPSS/Calc, a spreadsheet program; and DPSS/Calendar, a personal calendar and schedule management program. The DPSS package costs \$500 per nodal processor.

DSEE will be available in January, and DPSS will be available in February.

Apollo is headquartered at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

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# YOURDON

# PE 3200s Now Run in SNA, X.25 and BSC Nets

(Continued from Page 1)

low users to distribute computers and facilities over a wide area or geographically-dispersed sites or locally in multiple local-area networks.

The group of products that make up Pennet Plus feature the X.25 packet-switched network protocol; ANSI X.29 remote terminal access to support asynchronous terminals; and Ethernet Version 2, to connect multiple local systems.

User facilities of Pennet Plus include interactive terminal access, network printing, file transfer between systems on the network, a user program interface for network applications and a network management and control facility for control and user access security.

Pricing for Pennet Plus, which is available immediately, is based on the size of the user's processor. For instance, the initial license of Pennet Plus for a low-end PE supermini like the Model 3200 would cost \$2,300. To

implement the product on a medium-range system such as PE's 3230 or a high-end system such as the Model 3250 would cost \$4,700 and \$7,000, respectively.

Additional copies of the Pennet Plus software are priced at about 25% of the initial copy.

## Electronic Mail

Network Electronic Mail (NEM/32) is an optional facility that operates within the Pennet Plus network. It confirms the receipt of electronic mail transmissions and stores them in a private user area that can be accessed at a time convenient to the user.

NEM/32 allows users to create messages and memos, amend messages, send mail to local or remote users, manage files and transfer mail. The original license fee for NEM/32, which is scheduled to be available in February, is \$1,400 (low-end superminis); \$2,600 (mid-range super-

mini) and \$4,000 (high-end supermini). Additional copies are \$490, \$910 and \$1,410, respectively.

## SNA Gateways

SNA Gateways, a further set of products in PE's supermini networking philosophy, consists of the SNA/3270 and SNA/RJE emulators.

SNA/3270 allows interactive terminals, printers and application programs to connect to SNA/3270 supermini terminals. By providing users with Logical Unit Types 1, 2 and 3 support, the software makes a Series 3200 appear to be a 3270 cluster controller.

In addition, SNA/3270 provides an IBM 2880 printer emulator and interface to accommodate functionally equivalent PE equipment, a PE spokesman noted.

SNA/RJE is said to supply either real or virtual emulation of a remote job entry station, making a PE 3200 supermini appear to an SNA/SDLC

network as a Logical Unit Type 1 3276 RJE workstation. In real emulation, the package uses the PE Spooler for buffering. For virtual emulation, SNA/RJE permits applications programs direct access to the data stream.

Pricing for SNA/3270 and SNA/RJE is also geared toward the size of the user's system and the number of copies required. Both require purchasing a software base priced at \$2,800 for a low-end PE system, \$5,200 for a medium-range system, and \$8,000 for a high-end, 32-bit computer. The 3270 and RJE modules must be added to the base structure; the 3270 module costs \$1,600, \$3,000 and \$4,500, respectively, based on the first three pricing schedules, and the RJE module costs \$1,000, \$1,600 and \$3,000, respectively.

Additional copies of these modules are priced at approximately 33% of the original license cost, the spokesman said.

SNA/3270 is available immediately. SNA/RJE will be available in January.

## BSC Gateways

PE's BSC Gateways is a set of three products that collectively can be used to connect PE systems to BSC products and systems. Available now, they can also be used to interconnect with 3270 devices, Hasp RJE stations and 2780/3780 RJE stations.

BSC/3270, the first of the three products, is a high-level and interactive product that PE said is operationally identical to SNA/3270 but operates over asynchronous communications lines. It supports three BSC applications: 2780/3780 and Hasp RJE for batch processing and 3270 for interactive terminal/printer work.

BSC/3270 costs \$1,400, \$2,600 and \$4,000 for the low-, medium- and high-end systems, respectively.

The two additional portions of the firm's communications package are Hasp, which emulates an IBM Hasp RJE station over asynchronous lines; and 2780/3780 for RJE emulation. These products are priced approximately the same as SNA/3270 and SNA/RJE packages, PE said.

Finally, PE also announced an Ethernet Data Link Controller, which provides processor-to-processor communications at up to a 10M bit/sec Ethernet coaxial cable. It costs \$3,790 and will be available in January.

PE is headquartered at 2 Crescent Place, Oceanport, N.J. 07757.

## Corrections

The Information/Word Processing Association [Upper Management Lacks A Training], CW, Oct. 10] changed its name effective June 1 to the Association of Information Systems Professionals (Aisp). It is still located at 1015 N. York Road, Willow Grove, Pa. 19090.

The Computer Museum in Marlborough, Mass., [Not Your Everyday Burger], CW, Oct. 10] is no longer part of Digital Equipment Corp. It became a nonprofit independent public institution in June 1982.

## Compatible With IBM Micro

# Compaq Adds Portable With Hard Disk

By David Myers

CW New York Bureau

NEW YORK—Compaq Computer Corp. last week brought out a second 16-bit, IBM-compatible portable computer. This one features a 10M-byte hard disk drive and software compatibility with IBM's Personal Computer-XT.

The system—the Compaq Plus—is targeted at the XT market, but industry observers see corporate users turning to the machine more as a complement to rather than as a replacement of their IBM microcomputers.

Compaq, based in Houston, unveiled the 31-lb computer at a press conference here. The unit is architecturally similar to Compaq's first machine, but has a built-in 3½-in. Winchester disk unit, mounted in a cage to absorb shock, and a 360K-byte floppy diskette drive for backup.

The hard Winchester disk provides enough storage for 100,000 mailing addresses, a Compaq spokesman noted.

The Compaq Plus is also equipped with 128K bytes of random-access memory (RAM), two IBM Personal Computer-compatible hardware slots and a CRT display measuring 9 in. diagonally.

Like the IBM Personal Computer XT, the Compaq Plus runs under both MicroSoft, Inc.'s MS-DOS 2.0 as well as Basic 2.0 operating systems.

The basic Compaq Plus costs \$4,995. However, a full-blown system with monochrome card and display, MS-DOS and Basic, a color card and asynchronous communications capability costs \$5,110, about \$50 less than the list price of the IBM XT.

In addition, Compaq announced a \$2,500 kit that allows users of its first portable computer—which costs \$2,995—to upgrade to the Compaq Plus. The kit, which includes a 3½-in. Winchester disk and 128K bytes of RAM, will be available by the first quarter of next year.

Compaq President Rod Canion said the company is shooting for

three types of customers with its new system: users of floppy diskette-based IBM Personal Computers who have outgrown their storage capacity; would-be users who have not bought an IBM Personal Computer because of its limited diskette capacity; and current owners of the IBM XT who want a portable version in addition to their desktop models.

In fact, industry analysts at the press gathering told *Computersworld* that corporate users who already work on an IBM XT in the office and need a similar system for "field work"—at home, for example—would be the most likely buyers of the new portable.

# Apollo Beefs Up Its Line Of Scientific Workstations

(Continued from Page 5)

The DN660, with 2M bytes of main memory, a 19-in. 1,024-by-1,024 pixel bit-mapped color graphics display, 1M bytes of dedicated display memory, an integrated floating-point processor, detachable keyboard, local-area network interface and a license to use the firm's operating system, is priced at \$59,500.

Both systems will be available in February.

## Ethernet Gateway

The Domain Networking Gateway for Ethernet includes a bidirectional file transfer protocol for Ethernet and a unidirectional protocol for Domain mode virtual gateway services. Both of these services work in conjunction with Ethernet attached systems. Also included is a User Diagram Protocol, File Transfer Protocol and a communications controller and transceiver, Apollo said.

The Ethernet gateway features error checking, delivery and flow control, sequencing, third-party invoked file transfers, active and passive opens, host name internetwork, ad-

Compaq's Canion said also that his company, which has made its mark by offering one of the first portables that is totally compatible with IBM Personal Computer software, is not interested in duplicating IBM's recently introduced Personal Computer XT/370, which is capable of running IBM 370, 4300 and 30 series programs [CW, Oct. 24].

"The number of people who can run 370 software on the [Personal Computer] has to be very, very small," Canion said. "That's just not a very interesting market for our company."

Compaq is located at 12330 Perry Road, Houston, Texas 77070.

dress mapping and full-duplex communication.

The gateway, including an intelligent controller, transceiver, cable and transmission control protocol/internetworking protocol software access protocol, costs \$3,500. It will be available this January, according to Apollo.

The Domain server processor, the DSP160, offers a 32-bit architecture with applications, license to use a 256M-byte virtual address space. The unit can support a 68M- or 158M-byte Winchester disk drive, plus a 1.2M-byte floppy disk drive.

The server processor was designed to perform computationally intensive applications, Apollo said. It can optionally use a 300M-byte disk drive, a 1,600 bit/sec magnetic tape drive, or a Versatec, Inc. V80 plotter.

The DSP160, with 2M bytes of main memory, integrated hardware floating-point unit, three asynchronous I/O ports, a license to use the Apollo operating system and a network interface, costs \$37,500.

Apollo is home-based at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

## PE Unwraps Two Packages That Give 3200s Links to Unix, C

OCEANPORT, N.J. — Perkin-Elmer Corp. last week took a further step toward making its software compatible with other vendors' systems by unveiling one software package that can be used to port Fortran programs to Unix environments and another that is a full implementation of the industry-standard C language.

The company also announced a research and development strategy — Everywhere — that would adapt future PE systems and products to recognized industry standards.

PE described its Fortran VII and C compiler packages as "bridging" software that act as links between Edition VII, its Unix look-alike operating system, and OS/32, its real-time operating system. They were developed to let users transport applications up and down PE's 3200 series superminicomputer line, from the smallest to the largest system, according to a PE spokesman.

Fortran VII is said to be a complete implementation of the Ansi-77 Fortran standard language for Unix environments and provides the compilers necessary to port Fortran applications to Unix environments from other operating environments. The software's source code is compatible with all of PE's OS/32 Fortran compilers, a spokesman said.

Fortran VII costs \$3,400 for an original license fee.

### C Compiler

The C compiler is a full implementation of the industry-standard C language and handles the full set of data objects of the PE Series 3200 architecture. This portion of the bridge can be used to produce transportable code that can be easily moved between "operating system" and processor environments, allowing PE users to take advantage of the rapidly increasing number of C language applications, according to the spokesman.

In addition, the compiler is said to eliminate the need to program in assembly language and can be shared by any number of users.

Like PE's networking products, the price of the C compiler is based on the user's processor. For a low-end system, the initial cost is \$3,400; for a medium-range system, the cost is \$5,200; and for a high-end system, the price is \$7,000. Additional C copies cost about 33% of the original license price.

The Everywhere strategy announced by PE is a compatibility plan with the objective of adapting or enhancing PE computer systems to connect or coexist with any systems adhering to recognized industry standards, according to Patrick Zilvitz, group marketing director for the Data Systems Group.

Zilvitz explained that the strategy was formulated to take advantage of industry-accepted trends in hardware and software configurations and to fit into the widest possible user base.

PE is based at 2 Crescent Place, Oceanport, N.J. 07757.

## PE Moves Into Fault-Tolerant Arena

OCEANPORT, N.J. — A move into the fault-tolerant systems market was made today by Perkin-Elmer Corp. when it brought out its Resilient system.

Described as more of a high-reliability than a total fail-safe system, the Resilient system consists of two Series 3200 superminicomputers that are linked via the newly introduced Resilient software and back up each other. The software also works with an added disk storage device to back up the user's stored data.

The Resilient system is based on two software packages: a reconfiguration monitor that runs as a continuous task under PE's propri-

etary OS/32 operating system and tracks the dual operations of both computers; and an optional mirror disk system that provides dual images of all user files and transactions on a separate disk unit.

Operation of the Resilient system is virtually invisible to the user, according to PE. Each computer runs independently with separate applications. When a failure occurs, the surviving system takes control of those programs, environments and peripheral devices necessary for total operation.

In the event a single disk fails, the system detects the failure, alerts the system operator and automatically switches operations

to the remaining disk.

When the drive that failed is available again, the system supplies the operator with the utilities to guide the rate at which it will catch up to be in full synchronization, a spokesman noted.

The reconfiguration monitor software portion of the Resilient system costs \$15,000 for an initial license for each CPU pair. Additional licenses are priced at \$6,000 each. The mirror disk costs \$4,000 for a first license and \$2,000 for subsequent copies, a PE spokesman said.

More information can be obtained from PE, 2 Crescent Place, Oceanport, N.J. 07757.



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## Analyses Cover Wide Range

# Pundits Debate Impact of Disoss, Profs Updates

By Jim Bartimo

CW Staff

The way office automation consultant Amy Wohl sees it, IBM's recent updates to its Distributed Office Support System (Disoss) and Professional Office System (Profs) represent "a giant mopping-up operation" to pull together pieces of previously scattered office technologies.

Other industry pundits contacted by *Computerworld* last week saw the announcements from Big Blue as everything from the creation of "a full-blown electronic mail network" to the slow phasing out of the operating system for smaller IBM processors, DOS/VSE.

At the New York press conference to announce the Disoss and Profs updates [CW, Oct. 24], IBM said it had nearly realized its 1980 statement of intent to link together office systems. By extending the capabilities of Disoss and Profs and enhancing its Systems Network Architecture to allow office machines to communicate

with a host processor, IBM now allows users of its 8100 and 5520 distributed processing systems and Displaywriter word processor to exchange letters, memos and other documents.

"We think it means IBM has decided to keep Profs around, so they built a bridge to Disoss," said Wohl, president of Advanced Office Concepts Corp. in Bala-Cynwyd, Pa. "They've done a good job of pulling it all together."

Calling the Disoss/Profs bridge another mainframe-based architecture, Wohl pointed out that such complex computing power is necessary to achieve the type of file transfer most users want and need. "Many customers said, 'Oh no, another layered architecture,'" she noted.

As a result of the complexity of this integration, the DP department will probably be called in to handle the user interface, Wohl said. This will present problems for users without extensive DP resources.

In related office automation developments, IBM released its local-area network in Europe (Page 1) and published what many experts called the American version of the local net in its Research and Development Journal (Page 11).

Molly Upton, editor of the *Office Automation Reporting Service* for International Data Corp. in Framingham, Mass., saw the IBM announcements in a positive light. "Disoss is becoming part of a multinode distributed network where it used to be for document distribution only," she said. "It's beginning to look like a full-blown electronic mail network."

Disoss' new ability to run under both the MVS and DOS/VSE operating systems is a sign of change in the IBM operating systems, believes Dale Kutnick, executive director of the Boston-based Yankee Group. "I'm

going out on a limb by saying this," Kutnick said, "but we're seeing an effort to phase out DOS/VSE slowly. Users will be pushed toward MVS."

Another result of IBM's new alphabet soup of operating systems and office software will be a more complete integration of the Personal Computer environment and the 370 host environment, which have been very separate, Kutnick said.

"In the corporate environment, the Personal Computer is becoming a more compelling choice because [they] are part of the connection to the host."

## New 8150 Seen IBM Move Toward Fail-Safe Systems

By Tom Henkel

CW Staff

While IBM's newly announced 8150 distributed processor [CW, Oct. 24] does not directly compete with fail-safe processors such as those manufactured by Tandem Computers, Inc., the system appears to be a first step in that direction — at least as a redundant alternative for IBM's large-systems users.

For example, the 8150 offers users the ability to recover from a hardware failure in about three minutes. Furthermore, the system can be configured to write data to two separate disk drives. In the event of a system failure, the system can protect against data loss by retrieving data from the backup disk.

According to IBM, the almost continuous operation offered by the 8150 is aimed principally at large users of 8100 systems configured in a tightly coupled fashion to multiple host processors. However, users of 8150s that are loosely coupled to host processors, or those that use the system as a stand-alone processor, can also take advantage of the redundant architecture, a spokeswoman at IBM's Information Systems Division in Rye, N.Y., notes.

Like larger IBM systems such as the 3081, the 8150 uses dyadic, or closely coupled, processors. According to IBM product specifications, the 8150 architecture includes two central processors, called Processing and Control Elements (PCE), and two I/O buses. Both PCEs and I/O buses can function simultaneously, thus, according to IBM, increasing internal performance.

However, the 8150 is also equipped for duplex operation of PCEs, memory banks and I/O buses.

With the 8150, IBM has eliminated the integrated disk drives used in other 8100 processors in favor of external 8101 disk drives. This, IBM said, gives 8150 users the ability to switch all disk drives from one PCE to another.

The 8150 was designed to use one to four 8101 disk drives or a combination of 8101s and 8809 tape drives. Furthermore, 8101 disk drives can be connected to both PCEs by using a File/Type Switch. The switch is available from IBM as a requested pricing quotation item, IBM said.

The newly announced Release 2 of the DPPA/SP operating system includes enhancements that allow the 8150 to redistribute its own work load in the event of a system failure, according to IBM.

For example, users can access I/O devices connected to either PCE on the 8150. In the event of a system failure, Release 2 has been designed to perform automatically an initial program loading of the system to operate on the remaining PCE, with that unit having access to all I/O devices. In addition, devices attached to the 8150 via communications paths can also access either PCE, IBM said.

Lastly, DPPA/SP Release 2 includes an obviously redundant Shadow File Facility that allows users to write data to two disk drives. If one disk fails, transaction processing is automatically switched to the other disk drive. When the broken disk drive is repaired, DPPA/SP Release 2 can automatically synchronize the source and shadow volumes and resume shadow file processing, IBM said.

William Ackerman, president of DPK, Inc., a Cupertino, Calif., consulting firm specializing in 8100 systems, admitted he was surprised by the 8150 introduction. "The 8100 has an excellent reputation for reliability," and redundancy was not a feature 8100 users demanded, he said.

Jack Hart, an IBM watcher with the Framingham, Mass., market research firm International Data Corp., noted that the quasi-redundant architecture of the 8150 may also help users cut down on maintenance costs because "people can defer emergency maintenance until it is convenient for IBM and the customer."

## ACM Told OA May Squeeze Middle Managers Out of Jobs

By David Myers

CW New York Bureau

NEW YORK — Ballyhoed as a liberating force that would allow managers to work at home, office automation may be forcing middle managers to work longer hours — and may eventually squeeze them out of their jobs altogether.

Those were the conclusions reached by a panel of university scholars at the Association of Computing Machinery conference here last week.

Computer terminals in managers' homes, long portrayed as a way of freeing white-collar workers from the office, have in fact increased productivity — by getting them to work longer hours, said Margaret Olson, associate professor of business administration at New York University.

And Philip Kraft, associate professor of sociology at the State University of New York at Binghamton, used his own survey results as well as figures from the U.S. Bureau of Labor Statistics to show that the ranks of middle management are thinning.

### 'The Idiot's Revenge'

At computer manufacturers and software houses, the products designed for middle managers are threatening to replace these managers. "In this sense, the appearance of the 'user-friendly professional workstation' represents the idiot's revenge," Kraft said.

The most popular new organizational chart pictures a corporation as an hourglass "or the Mac West structure," Kraft said.

Middle management's ranks are being thinned to a mere communications link between the high-level executive offices and the workers on the bottom, Kraft explained.

Olson, discussing how office automation is changing the definition of

the work place, focused on "telecommuting, that is, communicating with work rather than commuting to work." Home terminals were originally celebrated as a way to free managers from the subway, the commuter trains and the clogged expressways. But large corporations with work forces at home have yet to appear, Olson said.

"Portable terminals have essentially become an electronic briefcase. Now we can leave work at five and still work overtime," the business school professor pointed out.

While there is evidence of increased productivity with the extension of the work place into the home, "such work is strictly for the most part occurring after hours," Olson said.

These developments have social implications, requiring that technological decisions, Olson said. "The technology is not value-free," she stressed.

According to Kraft, the language used to describe computer systems has shifted from "idiot-proof" to "user-friendly."

"The idea was to make a system so simple and to allow so few decisions that mistakes could not be made. As near as I can tell, however, 'user-friendly' describes exactly the same 'idiot-proof.' It refers to a system that allows the user very little discretion," Kraft said.

What is more, Kraft continued, the shift in language has been paralleled by a shift in computer marketing. Products like the IBM PC-XT 370, described by the sociologist as "a 370 in a (Personal Computer) box," Lotus Development Corp.'s 1-2-3 software and the Lisa, Apple Computer, Inc.'s highly advanced personal computer, all show that vendors have shifted their sights from clerks and secretaries to middle management.

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As appeared in  
BUSINESS WEEK,  
July 11, 1983

New This Week: International Report on Page 4

## COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY



As appeared in  
SYSTEMS & SOFTWARE,  
August 1983

The world is taking note of IBM's recent decision to market INTELLECT, Artificial Intelligence Corporation's English Language Information System. It is the first time IBM has come to an independent software vendor for mainframe business professional software. This important decision recognizes artificial intelligence as an important technique for solving business problems—one that companies can benefit from right now.

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# IBM Shows Token Ring Network in Geneva

(Continued from Page 1)  
performs considerably better than other local-area networks, a paper presented at Telecom '83 by engineers at the Zurich lab maintained (story on Page 11).

The IBM network consists of a series of star-shaped subnetworks, each controlled from a "wiring concentrator." A backbone ring connects the concentrators with each other and

with a "bridge" through which one backbone can be interfaced to others. The backbone actually consists of two parallel, separate message paths.

The network displayed by IBM at Telecom '83 consisted of only a single ring — a wiring concentrator connected to several terminals located within its exhibit area. Among the interconnected devices were 3270 CRT terminals, a 3275 front-end pro-

cessor, 8775 display terminal and 8100 distributed processor.

A device gains access to the network by changing the status of a constantly circulating, 1-bit "token" from "free" to "busy." The token is in the header of a message frame; this frame is then filled with all or part of the message itself.

After being delivered to the receiving station, the message frame is

returned to the sending station, thus confirming delivery. It is removed from the network at that point.

Digital voice and other kinds of synchronous traffic are transmitted with the help of a Synchronous Bandwidth Manager (SBM), a special station which, upon request, reserves a series of message frames ahead of time. The bits comprising the synchronous message are then sent through the network in bursts at regular intervals. They are buffered at the receiving point and then output.

By keeping the delay between bursts short relative to the speed at which the buffer is emptied, a voice message can be delivered in a way that sounds to the listener as if it is being spoken in real time.

## AT&T Won't Market Net to End Users

(Continued from Page 1)  
work will be at the 1984 Olympic games in Los Angeles, according to AT&T officials interviewed after the press conference.

Brown, who held the press conference just before giving the leadoff address at Telecom '83, the international telecommunications conference that began last week and ends tomorrow, also reported that Western Electric plans to market a series of 32-bit superminicomputers, the 3B family, on an OEM basis to systems integrators in the U.S. and abroad.

Because the superminis run under the Unix operating system, industry observers see AT&T's plan to sell as an OEM the 3B as part of an ambitious effort that is likely to see AT&T develop Unix-based application software within the next year.

At the press conference, Brown also maintained that AT&T has "no current plans" to market a personal computer.

### Two Superminis Planned

According to Brown, AT&T is planning to sell as an OEM two superminis, the 3B205 and the 3B5, which are modified versions of the processor used in AT&T's No. 5 ESS telephone network switch.

The 12M-byte 3B205 offers performance of 1 million instructions per second (Mips). Its peripheral memory can consist of up to 64 Winchester disks, each storing 675M bytes. The 8M-byte 3B5 is a 7 Mips machine with up to 640M bytes of disk storage.

The heart of the 3Bnet local-area network will be the 3B20A, an attached processor version of the 3B205. The 3Bnet operating at the Olympic games will interconnect the 3B20A to approximately 2,500 electronic message terminals modified to provide split-screen displays.

An estimated 50,000 users — administrative staff, security personnel, members of the press and the athletes — reportedly will be able to input and access messages through the system, which also will broadcast results of Olympic events and other information to the attending public.

### Entering Software Market

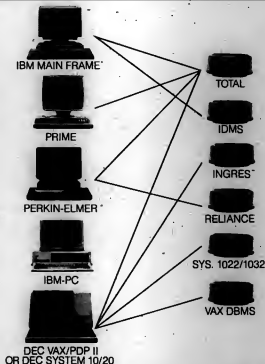
Asked whether AT&T plans to get into the software business, a spokesman noted that the company currently is marketing some application software to outside users, but pointed out that the software was originally developed for internal use. "We haven't yet gone into the commercial application software business," the spokesman said, "but I emphasize that word 'yet.'"

Since January, AT&T has been

providing documentation to Unix users outside the company and, since May, has been offering training to those using the roughly 100 Unix-based application programs being

marketed by others.

Development of Unix-based application software for the commercial market is thus seen as a logical next step.



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## Reliability Said Key Advantage Of IBM Net

By Phil Hirsch

CW Staff

GENEVA, Switzerland — Reliability is the major advantage of the token ring network displayed here last week at Telecom '83, according to both a paper delivered by engineers from IBM's Zurich laboratories and literature handed out by IBM at its booth on the exhibit floor.

Both sources attributed the local-area network's reliability in part to its star-shaped subnetwork architecture. Since each node is connected by separate send/receive links to the wiring concentrator, any malfunctioning node can be bypassed without

## U.S. Version of IBM Local Net Described

By Jim Bartimo  
CW Staff

IBM's American version of its local-area network will be a baseband token-passing ring architecture using copper twisted-wire pairs, industry consultants confirmed last week.

What is believed to be a full description of the local-area network appeared in September's issue of the *IBM Journal of Research and Development* in the form of a tutorial titled "A Local Communications Network Based on Interconnected Token-Access Rings." Written by Norman C. Strope, a staff engineer at IBM's Research Triangle Park Laboratory in North Carolina, the tutorial did not predict a release date or price for the local-area network.

The tutorial indicates that IBM's long-awaited local-

area network will add another level of connectivity to the recently announced upgrades to its Distributed Office Support System and Professional Office System software. Connection to the IBM Systems Network Architecture (SNA) is one such level mentioned in the tutorial.

"Token passing fits well into the SNA environment," noted Dale Kutnick, executive director of the Boston-based Yankee Group. "SNA will provide the higher level architecture and the control function."

The local network will be a variety of rings that — through token passing — will provide the synchronization of devices on the network. Today's most well-known local net, Xerox Corp.'s Ethernet, allows communication on a first-come, first-served basis through carrier-sense multiple access with collision detection.

out disconnecting the others.

In addition, the double message path within the backbone ring that

interconnects the wiring concentrators allows a faulty concentrator, or a faulty backbone link, to be bypassed

without bringing down the entire system.

The constantly circulating token provides a way of monitoring the system continuously, according to IBM. This feature, together with the relays within the wiring concentrators which allow defective components to be bypassed automatically, provides superior fault isolation and recovery, the company claimed.

IBM's local-area network can be deployed on twisted copper pairs, coaxial cable, fiber-optic cable or any combination of these media. The cable used in the local-area network displayed at IBM's Telecom '83 booth, for example, included two shielded twisted pairs which comprised the local-area net plus four wires for telephone communication.

IBM officials said fiber-optic cable could be used in place of or in addition to the twisted pair. Reportedly, this ability to use different transmission media provides increased design flexibility. Optical fiber can be specified, for example, only where its high bit rate is needed and its higher cost can be justified.

### Boasts Quick Delivery

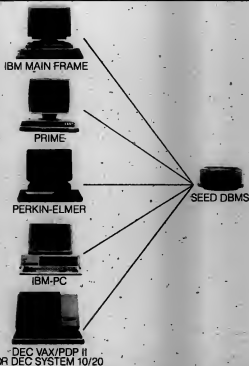
Another benefit of the IBM network pointed out in the paper presented at Telecom '83 is its reported ability to deliver messages quickly, even when there are many users on the line.

"If a collision occurs on a [carrier sense multiple access/collision detection (CSMA/CD)] bus, transmission will be aborted [and the message will have to be retransmitted]... the high collision frequency at high load levels [creates a] danger of stations becoming locked out for an unpredictable period of time," IBM said.

"A token ring, on the other hand, guarantees fair bandwidth sharing among all active stations, even at high load levels, due to the fact that the token has to be relinquished after the transmission of one frame," according to IBM.

While the network shown at Telecom '83 had a nominal speed of 4M bit/sec and an IBM technician acknowledged that the actual throughput is "considerably less," the Zurich engineers maintained that it performs considerably better than other local-area networks.

According to their paper, as utilization rises above about 30% of capacity, the mean transmission time through a bus-type local network employing CSMA/CD becomes significantly greater than mean transmission time through a comparable token ring network.



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## Claims Will Cut Long-Distance Rates

# FCC Chairman Defends Access Charge Ruling

By Phil Hirsch

CW Washington Bureau  
MONTREUX, Switzerland — Insisting that it will reduce long-distance rates 35% to 40%, the chairman of the Federal Communications Commission (FCC) strongly defended the commission's access charge ruling here last week.

Because of the decision to charge users for access to the dial-up network, lower rates already are being "offered by the new long-distance carriers," which "will allow the users of AT&T lines to enjoy reductions as well," Mark Fowler, FCC chairman, said. He mentioned additional benefits, including the likelihood that dramatically cheaper communications rates will make more likely the "marriage of computers with the telephone network."

Fowler was a featured speaker at Televant '83, an international telecommunications conference cosponsored by E.F. Hutton, Inc. and the law firm of Finley, Kumble, Wagner, Heine, Underberg, Manley, and Casey, which includes a number of former congressional communications policymakers.

Later, during a question-and-answer session, Fowler was asked whether the commission has a fallback plan in case legislation is passed that would bar imposition of a flat monthly surcharge on residential customers of local telephone compa-

nies. If this happens, nearly \$2 billion in costs would have to be collected from other sources, primarily business users.

In reply to the question, Fowler would say only that the FCC is thinking about such a fallback position.

Fowler was also asked whether he speaks for President Reagan. "I speak for his principles," the FCC chairman replied. Much of Fowler's talk, as well as that of another speaker, U.S. Ambassador to Switzerland John D. Lodge, was devoted to promoting free enterprise and the superiority of "free market decisions" over centralized government planning.

Fowler maintained that he was "not here to suggest that private ownership is the only way to develop a technologically advanced communications network; it is not."

But a little later, the FCC chairman began talking about the benefits of the U.S. approach, for example, the vast array of terminal equipment now available as a result of the FCC's equipment-certification/registration program.

But U.S. Court of Appeals Judge Abner J. Mikva, who spoke after Fowler, said the free market, noncentralized policymaking system employed by the U.S. is not without at least a few inconsistencies. He noted

that the courts have both increased and decreased government regulation of the communications industry in recent years.

For example, Mikva said, Judge Harold Greene's decision in the U.S. vs. AT&T antitrust case increased regulation by putting the U.S. Department of Justice in charge of monitoring the phone company's compliance with the agreement settling the case. Meanwhile, the FCC's Second Computer Inquiry decision, which allows the phone company to market unregulated products/services through one or more deregulated subsidiaries, decreased government control.

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## Access Charge Seen Subsidizing The Rich

By Phil Hirsch

CW Washington Bureau  
MONTREUX, Switzerland — The Federal Communications Commission (FCC) is forcing "residential users" to subsidize the rich," Charles Wohlsetter, chairman of an independent telephone company and a persistent critic of communications policymakers in Washington, D.C., charged here last week at an international conference.

"Twelve years ago," responded William McGowan, chief of MCI Communications Corp., "advanced technology" was a Princess telephone. Today, he said, the choices for users are much more significant and numerous.

Wohlsetter's and McGowan's comments were made during a Televant '83 panel discussion on the future of AT&T and the telephone industry after divestiture. Wohlsetter, the chairman of Continental Telecom, Inc., argued that deregulation may lower AT&T's share of the long-distance communications market, but new applications will cause that market to grow tremendously. He believes bypass services will become widespread; that local-area networks will bring about integration of voice, data and image communications; and that "virtually every home" will acquire voice and data communications capability, enabling many people to

(Continued on Page 13)

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# User Suit Against Honeywell Awaits Ruling

**NEW YORK** — The fate of a computer user's \$9 million lawsuit against Honeywell, Inc. is in the hands of a federal judge after an eight-day trial that ended earlier this month in U.S. District Court here.

According to papers filed in the case, plaintiff William M. Selden of Rochester, N.Y., claimed that Honeywell defrauded him by selling an untested, unworkable operating system (TL6) and by misrepresenting the capabilities of that software even, Selden charged, after both he and Honeywell realized its inherent design defects.

Selden attributed the demise of his fledgling computer accounting service — Accusystems, Inc. of Rochester — to the failure of the TL6 op-

erating system, which was designed for Honeywell's Level 6 minicomputer.

Selden, a former IBM executive who worked with the research team that developed Cobol, filed the suit three years ago [CW, Oct. 27, 1980]. He is seeking more than \$4.6 million, an amount he hopes will be doubled with punitive damages.

Selden's attorney, Thomas K. Christo, said he expects a decision from Judge Dudley Bonsal by December 1983. Honeywell has declined to comment on the suit until a decision has been reached.

Christo said in an interview last week that testimony during the trial indicated that the TL6 software was never fully tested and approved for

sale according to Honeywell's own internal guidelines. Selden, who planned to market the Level 6 mini on an OEM basis through Accusystems, was assured that TL6 was a multitier, multitasking operating system despite Honeywell's knowledge that the software was a "high-risk" product in that environment, Christo said.

According to the attorney, Selden was not informed that TL6 had severe memory restrictions in addition to internal flaws that caused the system to exhibit "fatal embraces," or frequent freeze-ups requiring restarts.

Christo claimed that Honeywell's Minicomputer Marketing Organization (MMO) rushed to provide an op-

erating system for the Level 6 mini, producing TL6 outside the standard software development channels and releasing it despite evidence that it was not a workable system. MMO also promised to offer the system only to OEMs, a practice contrary to Honeywell policy.

Christo said another 40 to 60 users have complained about the TL6 system, and at least one, Sizeler Realty Corp. of Louisiana, has already been awarded an undisclosed settlement from Honeywell.

Selden, now a consultant with New York City-based A.B. Computers, Inc., claimed that Accusystems, which he founded in 1977 to offer accounting services to small and medium-size businesses, would be a \$40 million to \$50 million enterprise today were it not for the Honeywell TL6 operating system. Selden based that estimate on the success of his other New York-based firm, Paychex, Inc., offering a similar service.

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Oct. 31, 1983 Comp. World 6 A-13 (p. 13)



## Seed Users Meet Set for Nov. 14

**VAIL, Colo.** — The Grange, a group for users of the Seed data base management system from United Information Services, will hold its fall conference Nov. 14-16 at the Kiandra Lodge here.

The meet will discuss new Seed features, techniques for enhancing data base performance, journaling concepts and implementation.

Members of the software users group can attend the conference for \$185, nonmembers for \$235. Information can be obtained from the Director of Seed Software Customer Services, 2300 Walnut St., Philadelphia, Pa. 19103.

## FCC Ruling Seen Favoring Rich

(Continued from Page 12)

work at home.

Theodore Brophy, chairman of GTE Corp., argued that an increase in local telephone rates caused by the FCC's access charge plan are likely to be temporary. Echoing Wohlstetter, Brophy said there would be many new applications, allowing the higher revenue requirement assigned by the FCC to the local loop to be spread over a larger amount of communications traffic.

Sam R. Willcoxson, executive vice-president of AT&T Communications (formerly AT&T Long Lines), argued that unless residential users pay a surcharge for access to the long-distance telephone network — which the FCC supports, but key congressmen oppose — business users will bypass the network.

Robert Hall, president of Satellite Business Systems, contended that virtually all of the bypass services to date supplement local exchange service rather than supplant it. Pending legislation, he added, bans the residential surcharge, but it also discourages bypass by requiring bypassers to help support their local telephone companies.

# THE LANIER FORCE

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## Deadline Pressures At New York Daily News' Felt by New MIS Director

By David Myers

CW New York Bureau

**NEW YORK** — Managing information for a big city newspaper like *The New York Daily News* is as hard a job as being a reporter — there is a daily deadline, and the pressure is enormous.

So says Brian F. Crynes, freshly appointed director of management information systems (MIS) at *The Daily News*. The 36-year-old Crynes joined the country's largest newspaper in mid-September from Price, Waterhouse & Co., one of the Big Eight accounting firms, where he had already worked with *The Daily News* as a data processing consultant.

"In the newspaper business, the timeliness and the accuracy of your information is very key. You've got to get a paper out every day," Crynes said, admitting that deadline pressures permeate throughout the entire news building on E. 42nd St. here.

Because an information supplier like a daily newspaper deals in only the latest facts, everyone at *The Daily News* is affected by the pressure, sometimes mounting to desperation, to get the most current information. Even things like financial data and personnel records, which in another kind of business might not be criti-

cally time-dependent, are expected to be up-to-the-minute at *The Daily News*.

That is why Crynes was brought in. The Pennsylvania native, who had no newspaper experience, was hired to modernize the paper's information processing operations.

"We're definitely in a catch-up mode. We're two to three years behind where we should be. Our thrust from here on out is to rebuild the MIS resource base at *The Daily News*," Crynes said.

When he first glimpsed the DP operations at *The Daily News*, Crynes found a "department that lacked overall direction. They didn't have any good plans. They had no focus of where their priorities were."

Morale had hit a low, too, largely as a result of uncertainty over the paper's fate. Two years ago no one knew if the Tribune Co., owners of *The Chicago Tribune* and parent of *The Daily News*, planned to sell America's original tabloid or close it down.

Now, however, the "thing about being sold or going under has gone away," Crynes said.

Tribune is "definitely committed to a revitalization of *The Daily News*," and the MIS department is a focus of the parent company's activities.



Deadline pressures that permeate throughout the entire *New York Daily News* news building on E. 42nd St. in New York reach the DP department, Brian F. Crynes said.

Crynes said.

Tribune hired Price, Waterhouse to take on the project of revamping *The Daily News'* computer operations. The accounting firm started work in June, with Crynes as project manager.

Crynes and his team from Price, Waterhouse interviewed 90 executives at *The Daily News* to find out what sort of information they needed and how badly. From the interviews emerged 38 different needs.

The consultants reduced these to eight. That was the first step — to define *The Daily News'* most pressing informational needs.

### Needs Analysis

This was followed by a needs analysis "to make sure our analysis of their needs was in fact their true needs," Crynes explained. Once everyone had agreed, the consulting team came up with a strategy for putting together an information processing system.

It was at about this point that *The Daily News* spirited Crynes away from Price, Waterhouse, almost as if *The Daily News'* execs saw Crynes as part of its long-range MIS strategy. "It was as a result of the job I was working on with *The Daily News* that they identified and recruited me," Crynes said.

Crynes saw it as a unique opportunity. "The normal career path would have been to stay with Price and eventually become a partner. This just sort of came up. Here I will have the opportunity to move at some point into the general management ranks," Crynes said, pointing out that "Tribune owns eight properties in print, broadcast and cable."

In the meantime, Crynes' first task is to comb through *The Daily News'* rapidly aging computer systems and weed out antiquated equipment. The current environment includes a Honeywell, Inc. DPS 7/55 mainframe that was brought in as an interim machine to work with equipment that had been around for 12 to 24 years and a Digital Equipment

Corp. Decsystem-2060 processor that is now three years old.

Software applications reportedly promised by DEC for the 2060 processor failed to materialize, according to William L. Cole, manager of DP operations and Crynes' right-hand man.

The paper will eventually replace its present data processing setup with entirely new systems. No vendors have yet been chosen.

"We will have a combination of a number of vendors. Who they are will be decided in the next couple of weeks," Crynes said. "I will be making that decision in connection with Price, Waterhouse."

The motto of the news business, Crynes explained, is "I want it yesterday." That is one of the problems facing Crynes: The paper's DP operations are inadequate, and everyone at the paper wants first shot at the newly installed systems.

### Project Strategy

To prevent a crunch, Crynes has drawn up a "project implementation strategy" to phase in the new systems and "balance out an even flow of work over the next three to five years."

In the newsroom, which has been automated since 1978 on text processing equipment by Allied Corp.'s Mergenthaler, the longtime maker of hot-type linotype machines, a review will be undertaken next year to decide whether to upgrade or replace the system, Crynes said.

So far, *The Daily News* has been happy with its automated newsroom, Cole said. Only once did the system fail badly enough to throw the ultimate scare — a missed edition — into the paper's editors. In the end, the paper was 22 minutes late, but it made the newstands.

In the future is a single shared on-line news library — what reporters used to call the morgue, a repository of every story written in the paper — for *The Daily News*, *The Chicago Tribune* and the six other news organizations within Tribune.

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# House Passes Small Business DP Crime Bill

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Legislation to help small businesses ward off computer crime was passed by the U.S. House of Representatives last week.

The Small Business Computer Crime Prevention Act, approved by the House last Monday and now awaiting Senate action, would set up a public/private sector task force to investigate the problem of computer crime in small business and recommend preventative measures. It would also direct the Small Business Administration (SBA) to establish an information clearinghouse on the subject.

The bill was introduced, according to its sponsor, Rep. Ron Wyden (D-Ore.), because "small firms have fewer resources and skills than larger organizations to devote to computer security and are less able to survive computer crime."

Introduced in May, the bill quickly picked up widespread, bipartisan support in the wake of recent reports of unauthorized access of computer systems by so-called computer "hackers." The bill would not set le-

gal penalties for that kind of unauthorized access, but rather is directed at warding off that activity [CW, June 13, Aug. 1].

During Monday's debate on the bill, Wyden said that "small businesses are the most vulnerable [to these kinds of] keyboard criminals. ... The biggest problem," he said, "is that many within the small business sector do not know where to turn to get factual, detailed information about computers in general and their vulnerabilities in particular."

## Security Task Force

The Small Business Computer Crime and Security Task Force called for in the legislation would, over an 18-month life,

- Define the nature and scope of computer crimes committed against small business concerns.

- Ascertain the effectiveness of state legislation and available security equipment in preventing those crimes.

- Develop, with the cooperation of the U.S. National Bureau of Standards (NBS), guidelines to help small firms evaluate the security effectiveness of computer systems.

- Recommend appropriate activities for the SBA information center mandated in the act.

The task force would consist of officials from the SBA, the NBS Institute of Computer Sciences and Technology and the U.S. Departments of Justice and Defense. Private sector

members would represent computer vendors, software vendors, the insurance industry, computer security firms and small business associations.

The SBA resource center provided for in the bill would provide information on computer crimes committed against small businesses and on security for computers owned or used by small firms. In addition to this, the resource center would also sponsor periodic regional forums to allow small businesses to exchange data related to computer crime and security.

A companion bill was introduced in the Senate Oct. 4 by Sen. Paul Tsongas (D-Mass.) and has yet to see any action.

## U.S. Firms Favor Renewal Of NTT Pact

WASHINGTON, D.C. — Despite disappointing U.S. sales to the Nippon Telegraph and Telephone Public Corp. (NTT), American equipment companies are in favor of renewing the U.S. sales agreement with the Japanese firm when it expires at the end of the year.

A survey of U.S. company officials by Congress' General Accounting Office (GAO) found that most believe the agreement by NTT to open its \$3 billion annual equipment procurement to American firms eventually will be successful.

The U.S. government expected the agreement, which went into effect Jan. 1, 1981, to lead to major sales by U.S. firms to NTT, but this has not been the case. During the 12-month period ending in March 1983, for example, U.S. firms sold to NTT only about \$38 million worth of equipment, most of it at the low end of the technology scale, GAO said.

Because of the disappointing record of the three-year agreement, U.S. trade officials have indicated they might not seek to renew the agreement, which could lead to increased trade frictions between the two countries. U.S. firms contacted by GAO, however, said a nonrenewal decision would be "premature." The agency's report said, "These officials had seen progress in their efforts to sell to NTT and were generally optimistic that, given enough time and the continuation of Japanese cooperation, they could successfully penetrate the market."

The firms told the GAO that they want to maintain access to NTT procurements because the company is about to begin a \$20 billion effort to upgrade its telecommunications system by the end of the century.

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1-CW-10-83

# Bankrupt Law Firm Files Suit Against Vendor

By Jeffrey Reeler

CW West Coast Bureau

OAKLAND, Calif. — A user that last year declared bankruptcy has sued a local vendor for allegedly renegeing on an agreement to supply a system that the user described as "crucial" to its survival.

The multimillion-dollar suit, filed on Oct. 11 in Alameda County Superior Court, accuses Mini Systems, Inc. of failing to provide Yanello & Flippen Law Offices with a desperately needed time-and-billing system. Mini Systems also stands accused of breaching its agreement to deliver a satisfactory word processing package and neglecting to furnish Yanello & Flippen with adequate programming and training services.

Serious shortcomings in the vendor's time-and-billing system purportedly left the law firm unable to bill its clients and collect fees for six months in 1980 and to date have reportedly cost the user \$450,000 in lost profits.

## Resigned 'in Frustration'

Yanello & Flippen also encountered significant problems with Mini Systems' word processing package, which proved so "inadequate" and "cumbersome" that some of the law firm's staff resigned "in frustration," according to the suit.

By late 1980, less than a year after the systems development effort began, Yanello & Flippen said its dissatisfaction with the project had be-

come nearly complete. But despite its discontent, the law firm found itself unable to replace Mini Systems with an alternative vendor for at least two reasons:

- All the software for the user's word processing and time-and-billing systems is written in a programming language proprietary to Mini Systems.

- Yanello & Flippen was almost entirely dependent on its vendor for hardware maintenance because of the nature of the user's configuration, which combines a Digital Equipment Corp. PDP-11/34 processor with peripherals from other suppliers. Mini Systems is one of only a comparative handful of companies that provide service for mixed-vendor configurations.

Further discouraging the law firm from severing its unwanted Mini Systems ties, the law firm said, was its early decision to discard its existing word processing and time-and-billing facility before the installation of the new system was complete. The complaint indicated that the user organization later came to regret its failure to maintain two parallel configurations.

In May 1982, after struggling for more than two years to salvage its proposed system, the law firm filed for bankruptcy protection.

Yanello & Flippen first burst into local prominence in 1978 when it became one of the U.S.'s first law firms to take advantage of a landmark Supreme Court decision allowing attorneys to advertise their services on TV and elsewhere. Within 15 months, the company's innovative marketing approach was attracting more than 500 new clients a month and had swollen the organization's administrative work load to thousands of transactions a month, the complaint said.

So staggering, in fact, did Yanello & Flippen's processing burden become that by 1979 the firm had launched a search for a new system to replace its existing control mechanisms. Of particular concern to the company was its former time-and-billing procedure, which had begun to hinder the organization's ability to collect client fees and was costing it \$38,000 in lost revenues each month.

## Cooperative Venture

In December 1979, after canceling the lease for its existing word processor and rejecting four alternative vendors, Yanello & Flippen joined Mini Systems and its president, Charles Breckinridge, in a cooperative venture to develop an integrated law office system. Under the agreement, Mini Systems was obligated to supply the user with all the necessary hardware, develop a word processing package patterned after Digital Equipment Corp.'s Decimate product and modify an existing time-and-billing program to do legal applications. The time-and-billing software originally had been written not for lawyers, but for accountants.

The agreement also called for the two companies to market the finished system jointly to other law firms and share the resulting proceeds. Installation of the system began in January 1980 and, because much of its software was reported to be already available, was scheduled to be completed in only five to six months.

But by the end of May 1980, the desired word processing package still "did not function as [Mini Systems] had represented, nor did it even resemble the program after which it was purportedly modeled," the complaint said.

Even after an additional two years of programming effort, the package remained "totally inadequate for use in a law office," the document said. Similar inadequacies also apparently characterized the system's time-and-billing programs and its other DP-oriented software.

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## Consultant Points to Development Center As Best Cure for Application Backlog Woes

By Paul Gillin  
CV Staff

SCOTTSDALE, Ariz. — If you have built or are planning to build an information center to address the applications backlog problem, you are really addressing only half the issue. Your development staff needs a productivity center of its own, a DP consultant said here last week.

The information center tends to alleviate the hidden applications backlog, or those applications that are never requested because of long DP lead times, said Vaughan Merlyn, president of Merlyn Consulting, Inc. in Atlanta. To produce the complex applications that end-user computing cannot solve, DP departments should look to the relatively obscure Development Center concept coined several years ago by IBM.

The Development Center is an information center that is targeted toward the professional programmer and treats development itself as an important application, Merlyn said in an interview at the Infodata Systems, Inc. National User Meeting held here last week. While most development tools — like applications generators, reusable code and super-efficient teleprocessing monitors —

are available today, the concept has received relatively little notice, he said. DP professionals are reluctant to give up traditional programming methods and to take a new approach to development.

The requirements for a Development Center are different from those of its end-user-oriented counterpart, Merlyn noted. They include:

- On-line access to a set of integrated, complementary development tools.
- A development structure that makes those tools available to every programmer when needed.
- Subsecond response time, an environment that dramatically im-

proves productivity, according to Merlyn.

- Batch processing in less than 15 minutes.

- Adequate storage for complex applications.

- A support staff that understands fourth-generation methodologies and prototyping and can optimize the Development Center environment.

- Special training support.
- A data system view that incorporates data base, data communications and data dictionaries.

Merlyn said many DP shops are still not taking full advantage of (Continued on Page 18)



CV Photo by P. Gillin

Vaughan Merlyn

### Three-Part Plan To Structure Future DP Center

SCOTTSDALE, Ariz. — The data processing organization chart of the future may well incorporate a three-part structure that more efficiently provides for the needs of end users and DP professionals, according to a DP consultant.

The future organization will consist of parallel components that include an information center, a development center (see story above) and a production center, according to Vaughan Merlyn, president of Merlyn Consulting, Inc. of Atlanta.

The production center will perform many of the technical functions now handled by programmers, including installation and maintenance, Merlyn said in an interview at the Infodata Systems, Inc. National User Meeting held here last week. The need for a separate staff is justified by the fact that most maintenance needs come up unexpectedly, forcing DP management to pull programmers off development projects in order to fight fires.

The production center will also coordinate quality assurance, ensuring that new applications meet the technical requirements for installation. As such, it will provide a "logical acceptance process" in which developers are reviewed by their unbiased peers, Merlyn said.

The emergence of the production center will change the job of programmer to a more analytical function, Merlyn noted. Development center staff members of the future "will probably be MBAs with a greater degree of business acumen," he said.

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## Packaged Applications: What's Your Experience?

Faced with tight deadlines, large backlogs and slim programming budgets, many DP installations are turning to packaged applications to provide a quick and cost-effective solution.

In the Jan. 30 issue of *Computerworld*, a Special Report on "Applications Software Packages" will look at the issue of choosing and modifying packaged applications to fit particular business needs.

Your input for this special section is welcome. Articles should be in the form of tutorials that offer advice or opinions on specific topics (but are not product-specific), or in the form of application

stories that describe your experiences with particular products.

Articles should be four to six pages, typed and double-spaced. Longer articles will be given lower priority and may be heavily edited. Black-and-white photographs as well as camera-ready artwork are welcome.

The deadline for all submissions is Wednesday, Nov. 30.

Further information and a one-page listing of guidelines can be obtained from John Gallant, CW Editorial. Manuscripts should be sent to him at *Computerworld*, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

## Development Center Seen As Remedy for DP Backlog

(Continued from Page 17)

their data base management systems (DBMS), using them as extensions of Visam files rather than as a method to manipulate entire applications. When a DBMS is used effectively in tandem with applications generators, reusable code and interactive program development, the foundation exists for a powerful development center.

The consultant called IBM's introduction of the 3270 Personal Computer and Personal Computer XT/370 [CW, Oct. 24] an important step in providing the "programmer's workstation," which is key to the Development Center.

Merlyn cited several factors critical to Development Center success. The DP department must first determine which areas of the development life cycle are causing the applications bottleneck and then look for tools that address those areas. Typically, DP shops "buy coding aids that let them produce the wrong program 10 times faster," he said.

Next, the department must determine the class of the job, whether batch, on-line or a combination of the two. One client, he said, installed IBM's CICS to run some of its major packaged applications, but could not use any of its development tools because they were not designed for CICS.

Another step is to identify the levels of job functions that need to be automated. "If you're recruiting [IBM] IMS programmers, you don't want tools that identify the need to know IMS," he said.

Likewise, "if the ultimate goal is to automate programming, why leverage the programmer? You want to leverage the analysts."

### Look Down the Road

Departments also need to look down the road at their future environments. It makes little sense to install a CICS productivity tool if the company may later scrap CICS, he noted.

Companies should also prepare for changing job functions that will result from the new productivity. Merlyn said. Programmers will begin to function more as analysts when code writing is reduced. Training becomes essential, both in familiarizing technical personnel with the new tools and in preparing them for changing job duties.

Finally, Merlyn advised that DP specialists begin to become comfortable with the concept of disposable code. Because development tools tend to generate code in different ways, maintenance may become very complex, he said. In the Development Center of the future, it may be easier to maintain software by throwing out the old code and generating new modules incorporating the changes.

## DPMA Announces Reps to Afips Board

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) recently announced that Carroll L. Lewis and Jerry Knierim will represent DPMA on the board of directors of the American Federation of Information Processing Societies, Inc. (Afips).

The appointments were announced along with the naming of Donald E. Price as DPMA representative to the Afips executive committee and the Afips nominations committee.

Lewis, the DPMA's international executive vice-president, is president of Commercial Data Corp. of Memphis, Tenn. Knierim is assistant DP director for Pioneer Corp. of Amarillo, Texas, and Price is senior vice-president of Bis-Tek, Inc. of Cincinnati.

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## Suggests Law for Record-Keepers

## Ware Pins Hacking Liability on System Operator

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Computer security and privacy expert Dr. Willis H. Ware last week suggested that systems operators should be held legally liable for "contributory negligence" when their systems are victimized by unauthorized access.

That move, he told a U.S. House of Representatives subcommittee investigating computer security, would "give the government a basis in law for acting against the record-keeping installation ... should state-of-the-art security safeguards not be in place."

According to Ware, a computer system is "an intellectually attractive [nuisance] that causes imaginative or criminally minded people to hack at computer systems."

## Electronic Mail Problems

Ware, who is on the corporate research staff of Rand Corp., also told the subcommittee last Monday that particular attention should be paid to privacy and security threats and problems associated with electronic mail.

Of the existing body of law related to electronic mail, Ware said, "It's not only underdeveloped, it's absolutely absent."

"A comprehensive business record service is what electronic mail is really all about. ... Can you imagine what a lucrative target it will be?" he added.

Besides the unresolved security issues surrounding electronic mail, a number of other related legal issues should be addressed, he said. For example, according to Ware, "It is not clear who owns the information in an electronic mail system."

Ware added that it is also unclear what the system operator's responsibility is in complying with or resisting search and seizure attempts by government agencies or what the system operator's liability is for lost, disclosed, stolen or abused information.

The privacy concerns are especially troublesome, he added.

Although declining to give further details, Ware told the subcommittee that the internal investigations of a federal agency have recently obtained on three separate occasions the complete electronic mail records of the agency's system. This, he argued, means all the system's users have been subjected to a criminal investigation conducted as a wide "fishing expedition" without legal due process.

The privacy abuses resulting from computer-matching programs the government initiates to gain access to disparate automated records will pale in comparison to the record-screening activities that can be pursued using electronic mail, Ware warned.

## Problem, 'Understated'

Rep. Dan Glickman (D-Kan.), chairman of the House Science and Technology Subcommittee on Transportation, Aviation and Materials, which has been looking into computer security and privacy — particu-

larly as it relates to the type of computer hacking that has received so much recent publicity — noted reports that hackers in several cities have gained access to government and private-sector electronic mail systems.

Glickman, commenting on Ware's testimony, said, "Many of the things you have said perhaps have been understated. The problems may become even more severe."

Ware suggested the subcommittee can expect to deal with this issue for at least the next five to 10 years.

"The computer security issue must be seen as analogous to the classical offense/defense situation," he said.

"As computer security safeguards be-

come stronger, the offenses against them will become more sophisticated."

"Therefore," he continued, "no organization or the Congress can assume that the computer security issue is one that can be looked at and forgotten. ... If Congress has the will to pursue this issue and pay sufficient attention to it, then I suggest ... we should get on with it."

## 'Major Leverage'

"I would suggest," Ware said, "that the government has a major leverage on this issue. It can make mandatory the inclusion of appropriate technical security features in

computer systems that it procures."

That action, plus private-sector efforts to muster "the corporate will to address this problem," will force computer vendors to develop product lines with adequate security, he said.

Ware suggested that the National Bureau of Standards' Institute for Computer Sciences and Technology be directed to develop "a menu of technical features" that would be mandatory for federal acquisitions. He also said the government should develop "a comprehensive handbook of preferred practices and procedures for running a computer center — and a security."

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# DATAPRODUCTS

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## Computer Crime Insurance Available — For a Price

By Patricia Keefe  
CW Staff

Publicity about the growth of computer-related crime and the technological advances that aid systems violators have spawned a number of computer fraud insurance policies.

The policies come in many shapes and sizes. Generally providing coverage up to \$30 million minus a deductible that can go as high as \$1 million, some insurance firms such as Shand, Morahan & Co. of Evanston, Ill., may increase that coverage to \$100 million.

Various estimates for annual premiums have ranged from a premium surcharge of 10% to 30% for rider policies to \$7,500 to \$100,000 for separate policies.

Unlike standard forms of business crime insurance that protect businesses against fraud committed by employees, many of these new policies offer protection against computer fraud committed by nonemployees away from the company premises. Shand, Morahan even covers unauthorized access by so-called thrill-seeking pranksters and hackers.

Among the policies on the market today are:

- Shand, Morahan & Co. — Its "Unauthorized Computer Access Insurance" policy is available both to businesses and financial institutions. For coverage to apply, the policy does not require that the perpetrator be seeking financial or other gain, according to a product brochure.

- The policy covers two risks: the client's cost to replace programs, data or materials lost or stolen; and the client's legal liability to others as a result of confidential information, such as customer lists or financial statements, getting out to unauthorized individuals.

Specifically, the policy covers the cost of restoring the computer system to its

condition prior to the unauthorized access, including costs to restore data and programs; extra expenses incurred to continue business operations until the system is restored; and other pecuniary loss directly attributable to the destruction, modification and/or use of data obtained via unauthorized use.

The criteria by which Shand, Morahan judges risk include the limit of liability

deductible, the amount of deductible, the client's security system, the kind of risk involved and the client's disaster plan, if any.

- St. Paul Fire & Marine Insurance Co. and Aetna Life and Casualty Co. — Both offer riders attached to bank blanket bonds, standard policies that insure banks against loss from theft and fraud.

St. Paul's covers fraud or theft committed by nonem-

ployees who "must have materially benefited from the loss," a spokesman said.

- The Travelers Corp. of Hartford, Conn. — Its "Computer Fraud Insurance" specifically covers the use by a nonemployee of any computer to transfer money or other property from company premises, or the premises of its bank, to another place from where it can then be stolen. It was designed to

meet the insurance needs of most businesses except banks, brokers and similar financial institutions.

The company is studying the "significant potential" for loss that could be incurred by various financial institutions, a spokesman said, adding that "the losses could be tremendous." However, he predicted coverage for these institutions will be introduced at a later date.

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instance, we're introducing a new high-speed band printer with changeable type. Operating now with IBM's SNA, we've also added new, low-cost distributed data processing capabilities for more system versatility, and to provide for future growth toward the integrated office.

### PUG-East Meet Set for Feb. 12

BALTIMORE — The Eastern Region of the Prime Users Group (PUG-East) will hold its annual conference Feb. 12-15 at the Hyatt Regency Hotel on the Inner Harbor here.

The meeting will mark the first time PUG-East has allowed non-Prime vendors to exhibit their wares. Registration for the full conference costs \$170. Single-day attendance fees range between \$25 and \$80, the group said.

More information can be obtained from PUG-East through P.O. Box 138, South Attleboro, Mass. 02703.

# We're back



# Insurers Say 'Anti-Hacking' Policies Not Selling

By Patricia Keefe  
CW Staff

With computer hacking apparently on the rise, or at least more in the public's eye, it would seem that computer fraud insurance would be a hot seller among security-conscious data processing managers. But it is not.

The fact is that although insurance protecting against illegal computer access or destruction of data is a good

idea, clients are reluctant to commit themselves to policies that carry heavy premiums and have a hard time putting a price on the corporate data resource, according to representatives of several major insurance firms offering computer fraud policies.

"Out of 2,500 client banks, we've only sold our computer-theft rider to about 5%," said Allen F. Stendahl, fidelity bond underwriting man-

ager at St. Paul Fire & Marine Insurance Co. About 85% of those sales were to larger banks, typically with assets in excess of \$500 million, handling tremendous amounts of electronic funds transfers. Community banks with assets under \$100 million, however, "don't feel they have the exposure to justify the policy," he added.

His sentiments were shared by representatives

from both The Travelers Corp. of Hartford, Conn., and Shand, Morahan & Co., an Evanston, Ill.-based insurance underwriter. However, representatives of both firms claim the recent publicity surrounding the escapades of young computer hackers and their attacks on corporate and government data bases has spurred the number of insurance inquiries by as much as 20% to 30%.

While the cost of fraud insurance can be high, St. Paul's Stendahl did not find the premium to be a consideration. He pointed out that few legitimate inquiries asked the price of the policy. He put the blame for slow sales on corporate executives who place a low priority on system security, misconceptions about the system's security and a belief that "it hasn't happened here, and it never will."

Another problem — both for the insurer and the client — lies in quantifying the value of a corporation's data bank. One way to get some idea of the data's value is to look at the statistics of past computer crimes.

## Losses Up to \$3 Billion

For example, losses stemming from computer-related crime are estimated to range between \$100 million and \$3 billion a year. According to 1981 Federal Bureau of Investigation statistics, the average take is about \$502,000, although losses have ranged as high as \$21.3 million and \$10 million at two large West Coast banks.

Since computer fraud often goes undetected or unreported, many computer crime experts suggest that actual losses are probably much higher.

In addition to the value of the data itself is the cost to the company in man-hours to locate, compile, interpret and enter all that information into the system. It can be both time consuming and costly to replace data lost as a result of computer criminals or careless hackers. Even more costly can be the loss of business due to damaged data or hardware.

When financial institutions and other business concerns realize the extent of the damages they could incur as a result of unauthorized systems access, sales will increase, believes Don Bray, vice-president of underwriting for Shand, Morahan. He added that another barrier to sales is simply that many potential customers may not be aware that computer crime insurance, which has been around for about two years, is even available.

Among the firms that presently offer computer fraud policies are Lloyds of London, which offered the first U.S. policy in 1981 for commercial banks; St. Paul Fire and Marine; Shand, Morahan; Actua Life and Casualty Co.; National Union Fire Insurance Co.; Chubb & Sons, Inc., through its underwriting subsidiary, Federal Insurance Co.; and Risk Advisory Corp.

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# International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

## AUSTRALIA

**SYDNEY** — A group of credit unions here has banded together to establish a company that will provide financial institutions and retailers with a network for electronic funds transfers. Large department store chains will be able to access the service of the new company, Electronic Funds Transfer Services Pty. Ltd., by point-of-sale terminals.

## BRAZIL

**SAO PAULO** — Tension and disagreement between American and Brazilian viewpoints were strongly felt at the Seventh U.S.-Brazil Producers Council Meeting here earlier

this month. When Brazilian Minister Camilo Penna raised the issue of government market funds during his keynote address, the American contingent, led by Burroughs Corp. President Michael Blumenthal, argued for more liberal government policies that would facilitate technological solutions in Brazil.

## CHINA

**BEIJING** — A delegation of four Chinese scientists and educators will attend the Data Processing Management Association's 1983 International Computer Conference and Business Exposition in Baltimore this week. The rare visit by the Chinese

computer scientists and educators is in response to a visit by 14 American and Canadian computer executives to China last summer.

## SWEDEN

**LINKÖPING** — A newly formed Swedish company, Context Vision AB, has unveiled a "thinking computer" here called the General Operator Processor (GOP). GOP is capable of associative thinking and, to a large extent, self-programming, a Context spokesman said. Said to represent the culmination of four years of development by a group of researchers at the Linköping Technical University, the machine's main application is

image processing in medicine, remote analysis and industrial processes. GOP consists of two computer systems, is capable of performing billions of instructions per second and will be available next fall.

## WEST GERMANY

**MUNICH** — The Systems '83 Conference held here last week broke another attendance record, racking up 80,000 registrants this year. The show, which attracted 44,000 people last year, hosted about 962 vendors. Microcomputers enjoyed most of the attention at this year's show.

**MUNICH** — Siemens AG introduced a micro here aimed at the distributed DP market. Called Mikro 9780, the system runs under a Unix-like operating system and can function either as a stand-alone system or as a terminal linked to Siemens mid-range host processors within the vendor's proprietary Transdata communications network.

## FRANCE

**NICE** — One week before Telecom '83, which is being held in Geneva until tomorrow, IBM unveiled here its European telecommunications strategy. Systems Network Architecture (SNA) will be considered the matrix for future development of all IBM telecommunications products. This strategy will not, however, apply to a few special marketplaces, including France. IBM also said it will rely on Rolm Corp.'s CBX as an integral part of its SNA telecommunications strategy.

**TOULOUSE** — The establishment of a European center dedicated to scientific computation was one of the recommendations made at a recent Technologies of the Future Conference here. The proposal for such a center will be presented to the European Communities Council (ECC) early in 1984. With the entry of nearly Portugal and Spain into the ECC, it was suggested that the center be located here. The center would run with a Cray Research, Inc. mainframe, which would be hooked up with a Honeywell-Bull Multics front-end processor.

## MEXICO

**MEXICO CITY** — Basico is the name of a recently unveiled Spanish computer programming language that is said to run on most major microcomputers and minicomputers. The company that developed the language, Edidatax, said Basico can run on Digital Research, Inc.'s CP/M and MP/M operating systems as well as Cromemco, Inc.'s Cdos and Software 2000, Inc.'s TurboDOS.

**MEXICO CITY** — While the government here is taking steps to encourage the development of domestic hardware and software, the importation of these products is expected to expand over the next several years. The installed computer base in Mexico is estimated at approximately 2,000 mainframes, plus 6,000 minicomputers and microcomputers.

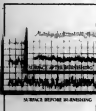
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## Work No Longer Abstract

# Bio-Chip Researchers Bemoan Lack of Funding

By John Gallant  
CW Staff

ROCKVILLE, Md. — Researchers in the field of biotechnology — the union of organic chemistry and electronics — say that progress has been slowed by a lack of funding from both the government and private sector.

"The theoretical basis of our work has been solidified, and the physical reality of these principles has been illustrated in the past two years. This technology has moved out of the abstract and into the laboratory," James H. McAlear, president of EMV Associates, Inc. here, said in a recent interview. EMV Associates, which was recently acquired by Gentronix Laboratories, Inc., is the sole U.S. firm dedicated to applying genetics and biology to the design of molecular-level microcircuits, or "bio-chips" [CW, April 19, 1982].

Some researchers are attempting to use existing biological systems, such as large protein molecules, to produce workable electronic circuits and switches. Others are trying to synthesize an electron-trained molecule from scratch.

### Five Hundred Times Smaller

The goal of both camps is to produce functional microcircuits that experts say could be as much as 500 times smaller than current silicon- or germanium-based devices. In the not-too-distant future, perhaps, those molecular microcircuits could be linked to form a pint-size computer with the power of vastly larger supercomputers.

Along with the recent advances in molecular electronics has come increased interest in the technology, though not enough to spur the necessary influx of investment capital. "I would estimate that there are 10 times as many people involved now as there were two years ago," McAlear said. "In addition, many nations have become involved in research, such as England, Israel, Australia and especially Japan, where we've been received very warmly at conferences. We're certain that the Russians have started up with research also. As a result, there has also been a heightened media interest in both the foreign and domestic press."

But, McAlear said, "although we've made some technical progress and gotten some media [coverage] in

## Manual Targets Those Selling Own Software

ESTILL SPRINGS, Tenn. — A manual written specifically to guide programmers interested in selling their own software creations was recently announced by ATC Software Co. here.

The manual, reportedly provides direction on obtaining national directory listings, pricing new products, locating and qualifying a new advertiser, writing user manuals and operating mail-order fulfillment services from home.

The 78-page manual is available for \$20. Additional information is available from ATC Software, Rt. 2, Box 446, Estill Springs, Tenn. 37330.

a corporate sense we've made very little progress. We had hoped to have more venture financing by now, but I fear that this field is regarded by many as very futuristic."

Forrest Carter, director of molecular electronics research at the Naval Research Laboratory in Washington, D.C., also said funding problems are hampering the development of molecular microcircuit prototypes.

"Three years ago I would have thought we'd have a prototype device by now. If we'd had more funding, that would have happened," Carter said. "Conceptually, we've made appreciable advances, but not much real experimental work has

been done.

"It's clear that the Japanese have already committed themselves in this field," Carter continued. "I think they have made some important advances in related areas, and it's obvious the field will continue to grow due to the sheer force of the ideas. But, where this goes depends on the funding. In this country, not a lot of money has been devoted to a major experimental program. For example, the research effort here is down to only one person — myself."

Carter's work in molecular electronics is funded through the Office of Naval Research, while McAlear's firm relies on grant money from the

National Science Foundation. Both agree that greater government involvement is critical to ensure advances in molecular microcircuit design.

In fact, McAlear said, a recent report published by the Mitre Corp. concluded that the federal government would be the main force driving research in molecular electronics in the years to come.

The House Armed Services Committee has recommended that \$10 million in 1984 defense appropriations be earmarked for research like Carter's, but that funding has been threatened by lengthy congressional debate and delays, he said.

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## Telecommunications Meet Slated for London on Nov. 29

LONDON — The third consecutive conference on World Telecommunications, to be held here at the Royal Lancaster Hotel on Nov. 29-30, will highlight the challenges and commercial opportunities worldwide that the emerging electronic information age offers for telecommunications carriers, their customers as well as their equipment manufacturers.

The conference is expected to be of particular interest to senior executives in the electronics and telecommunications industries and to their bankers and customers.

The Rt. Hon. Cecil Parkinson, Secretary of State for Trade and Industry, UK, will give the opening address on "United Kingdom Developments in the International Context," according to a spokesman.

Viscount Etienne Davignon, vice-president of the Commission of the European Communities, will be a guest speaker, addressing "European Prospects in Telecommunications," the spokesman said.

The four tracks of the conference will focus on meeting the customer's needs in the information age, supplier strategies, the customer's view and trends for the future.

Registration information is available from the Financial Times Conference Organization, which is located at Minster House, Arthur St., London, England EC4R 9AX.

## Forum to Cover Control Of Micro Use in Large Firms

WASHINGTON, D.C. — The National Research Council Commission on Engineering and Technical Systems will sponsor "A National Executive Forum: Managing Microcomputers in Large Organizations" Nov. 7-8 here.

The conference will address the ramifications of decentralized computer use throughout a large organization. It will feature presentations on policy alternatives for guiding the transition into decentralized computer use.

Reports outlining five pilot programs and systems designed to integrate central and desktop computing will be presented, the council said.

The forum, which will be held at the National Academy of Science auditorium at 2101 C St. N.W., is free, but preregistration is required. Information on registration for the conference is available from the National Research Council's Board on Telecommunications and Computing Applications at 2101 Constitution Ave. N.W., Washington, D.C. 20418.

## Video Courses Offer Training In Management

ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. (ASI) has introduced a series of video-based training courses called "The Information Age Technology Management Curriculum," which offer training in business technologies and information processing systems.

The curriculum focuses on training in the following five areas: information centers, personal computing, emerging technologies, computing literacy and systems development management.

Prices for the curriculum are based on several leasing plans ranging from \$50 to \$100 per month.

Further information is available from ASI, 2340 S. Arlington Heights Road, Arlington Heights, Ill. 60005.

## Booklet Recaps Personnel Meet

NEW YORK — The Association of Human Resource Systems Professionals (HRSP), sponsors of the conference on "Technology of Personnel" held here last May, has made available in booklet form the three-day meeting on personnel information systems.

Included in the booklet are presentations by speakers including futurist Isaac Asimov, human factors pioneer Alphonse Chapanis, IBM researcher Lance A. Miller, The New York Times Personnel Vice-President Guy T. Garrett Jr., the U.S. Department of Labor's Albert Angrisani and a recap of other sessions and 16 workshops on personnel and information systems issues.

The price for the booklet is \$400 for members and \$500 for guests. Further information is available from HRSP, Second Floor, 3051 Adeline St., Berkeley, Calif. 94705.

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Puppy Timp I strip the lipper "p" I got a "e."

# Downtime Linked to Air Conditioning Ills

By John Gallant

CW Staff

CAMBRIDGE, Mass. — A failure of the air conditioning system in your DP shop is good reason to lose your cool, especially in light of a recently completed study that indicates that a loss of air conditioning is one of the most frequent causes of downtime in corporate computer environments.

Consultants from Arthur D. Little, Inc. reviewed the computer centers of eight large telephone and utility companies during the past two years and found that the breakdown of air conditioning system controls was the major culprit responsible for costly and aggravating computer downtime.

Further, the consulting team discovered that while computer hardware failures were usually limited to one of several machines, air conditioning problems often led to the shutdown of the entire computer center.

## Failure of Controls

"The failure of air conditioning controls, such as temperature sensors or pneumatic tubes, stands out quite a bit," said Russ F. Patel, the mechanical and heating, ventilation and air conditioning specialist who directed the consulting team.

"Control failures were more frequent than any other problem we encountered. When system controls fail, the computer must be shut down or it will overheat and possibly be damaged in a matter of minutes," Patel said.

Frequently, Patel said, large air conditioning systems fail because they are not equipped with adequate backup.

"Without built-in redundancy, the failure of a single component can cause a computer to crash. Surprisingly, we found that some large air conditioning systems had only one temperature sensor, for example.

"If that goes, you've got big problems. It doesn't cost much to have two, or even three, such sensors installed, and that backup is a must," he said.

Among the other causes of air conditioning system failure, Patel found, were lack

of preventive maintenance, poor support systems design and inadequate alarm systems.

Also, "large computer centers are generally in a state of continuing change, with computers and related equipment constantly being added or relocated," he said.

"In that environment, cooling requirements can suddenly exceed the capacity of the system and the margin

of redundancy built into it," he said.

Concern about the reliability of the air conditioning system protecting a major hardware investment is not limited to large companies. "Size is not a critical factor here. Any company that requires constant air conditioning for its computer center should be concerned."

What can be done to guard

against air conditioning malfunction?

"With new computer centers," Patel said, "it is important to have the design reviewed from a reliability standpoint before you sink in a lot of money. You can really save yourself a lot of money and hassles."

For existing computer centers, "proper, periodic preventive maintenance, as well as equipment replace-

ment, is important. A lot of people simply perform bandage work on air conditioning equipment that really should be replaced. That can lead to big problems."

The highlights of the consulting team's findings are outlined in "News Notes: August '83" available from Arthur D. Little's Public Relations Department at 25 Acorn Park, Cambridge, Mass. 02140.

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For a technical data sheet, write to Hewlett-Packard, Literature Distribution, H20 Embecadero Rd., Palo Alto, California 94304 or for more information, call your local HP sales office listed in the telephone directory white pages. Ask for an HP Instruments Field Engineer.



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Peter J. LaSalle

PETER J. LASALLE has been promoted to vice-president and general manager of information services for Market Facts, Inc. in Chicago. Market Facts is a market research firm that conducts studies in the areas of consumer products, industrial strategies, governmental operations and financial services.

In his new position, LaSalle will be responsible for all data entry, data processing and system support activities.

LaSalle joined Market Facts in 1970 and worked on several management assignments within the company's DP component.

WILLIAM F. THOMAS has joined Pertec Peripherals Corp. (PPC) as director of corporate management information systems. In his new position with the firm, located in Chatsworth, Calif., Thomas will be responsible for all data processing activities as well as the company's other areas of electronic communications.

Before joining PPC, Thomas, who has had over 25 years' experience in both DP and materials control, ran his own software development and consulting company.

He has also held positions at Singer Business Machines, Dalmo-Victor, Sylvania and Ampex Corp.

JOHN J. DE MITA has joined the American Business Information Service Corp., subsidiary of American Savings Bank in New York, as senior vice-president responsible for administrative systems and procedures, data processing and the mini systems group.

Before joining American Business, De Mita was vice-president of planning and development for Savings Management Computer Corp., a Boston company servicing 57 savings banks in Massachusetts.

Previously, he was with the New York Bank for Savings for 17 years, the last three as vice-president and director of management information systems.

De Mita attended Brown

University Graduate School of Banking in 1979 and 1980. He received his bachelor of science degree from New York University, where he majored in math and science.

MANOLO S. AMICH has been named director of data processing services for Universal Insurance Group (UIG) in Coral Gables, Fla. He will be responsible for the design and implementa-

tion of multiple applications for UIG's Wang VS-1000 and Sperry Corp. 80 systems.

Amich joined UIG in February after five years with General Insurance Corp. in Miami Beach, Fla.

His background also includes data processing experience with LaSalle National Bank in Chicago and United Airlines.

He holds a B.S. degree in finance from the University

of Illinois (Chicago Circle) and an A.S. degree in DP from Triton College in River Grove, Ill. The latter was acquired while Amich was a DP instructor and serving as manager of the college's DP department.

WINFRED BOWMAN has been appointed regional technical manager of the St. Louis branch office of Computer Associates International.

He will manage a department of system engineers and provide ongoing technical support to other departments.

Bowman previously worked for McDonnell Douglas Automation Co., Ralston Purina Co., Southwestern Bell Corp. and Four Phase Systems, Inc.

Bowman holds two B.A. degrees, one in mathematics from Eastern Illinois University.

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### Access to Corporate Data

The top priority problem we hear from and users: How do I get to the data I need? The answer lies not only

## Managers on the Move

sity and another in computer science from Southern Illinois University.

THEODORE J. MADICK has been appointed director of management information systems for Omnicor, Inc. in Akron, Ohio. Madick will be responsible for consolidating the computer functions of all the Omnicor companies, including uniformity of hardware and software applications.

tions, and for developing corporate statistics that will provide more management-oriented information.

Since 1975, Madick had been with Newell Leasing Systems, Inc., a truck leasing company in Akron that is a wholly owned subsidiary of Omnicor. He began at Newell as data processing manager and advanced to director of management information systems there in 1980.

Previously, Madick had been with Myers Industries in Akron for six years, spending the last two years as the company's systems analyst and programming supervisor.

He attended the University of Akron and completed advanced computer training courses with IBM and technical schools.

NANCIE L. SILL has been

named to the newly created position of director of management information systems for Contel Credit Corp. in Atlanta. Sill will direct the corporation's data processing systems and programming activities as well as systems design programming and computer applications.

Sill most recently served as vice-president and manager of the Data Services Division Control for First At-

lanta Corp.

She also held the positions of manager of project management and assurance and manager of systems assurance for that corporation. Earlier, Sill served as a systems engineer for Electronic Data Systems of Dallas.

She holds a B.A. from Florida State University and has received advanced data processing training from Honeywell Institute of Information Sciences and Electronic Data Systems.

## Guide Covers Performance, Price of Micros

ROCKVILLE, Md. — The Management Training Institute, Inc. has announced publication of "The Personal Computer Price-Performance Guide," which it said was published to help guide the user through the maze of microcomputer system features, capabilities and pricing.

A numeric indicator called the Price-Performance Indicator (PPI) has been developed based on over 40 features of nearly 100 personal computers, the institute said. The PPI is based on a theoretical "standard" system with a value of \$2,000 and typical specified capacities.

Alternative systems are rated against the standard, gaining points for additional capacity and losing points where deficient from the standard. The result is a single indicator of price performance, where a value less than 1.00 is inferior and a value greater than 1.00 is superior to the standard.

The price of the guide is \$19.95. Further information is available from the Management Training Institute, 11317 Old Club Road, Rockville, Md. 20852.

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# Communications Net Seen Key 'Corporate Asset'

By Lynn Haber  
CW Staff

NEWTON, Mass. — "Your networks are going to become major corporate assets of your companies and, further, if you do it well enough, they may become strategic weapons."

Speaking at a seminar here recently on "The Network as a Corporate Asset," Howard Anderson, president of The Yankee Group, a Boston-based research and consulting firm, told approximately 125 business executives that the key to corporate strategy for now and the future is communications. The seminar was sponsored by the Boston chapter of the Society for Information Management.

Anderson outlined from a management information systems (MIS) point of view how a company can build its network in a way that can give it a major systems and competitive advantage. "In the midst of the beginnings of disintegration by AT&T, you are faced with an unprecedented amount of confusion. There are tons of unknowns out there, yet at the same time a number of major companies are beginning to build their network as a corporate asset," Anderson said. "Not only financial institutions, but every company is attempting to build a link to its customers that will be an on-line interactive link, realizing that its communications and information systems plan is part and parcel to its corporate strategy."

What is imperative, according to Anderson, is that a communications MIS strategy be explicit, in writing, and understandable and that the strategic plan of the business be related well to the MIS department.

Electronically delivered services are one item that allow companies to create a distinctive advantage. "What major financial institutions are doing is migrating customers to higher value services, electronically delivered. Electronics does well what physical distribution and bricks and mortar do poorly," Anderson said. "Their strategy, of course, is to take to high ground, to move as quickly as possible into data base, data processing and communications."

"They're going to try and trade

customer loyalty for data processing and communications."

A company has a competitive advantage, Anderson said, by operating from the premise that it wants to control costs better than its competitors. Then it must address the following questions: Can it provide more useful functions for the same dollar? Is it able to recognize the potential of high technology earlier than its competitors? Will it be able to integrate this technology into the company and overcome human/organizational barriers?

"The weaknesses of a company's competitor will be that it treats its network as an expense and not a weapon, and it will have failed to enter some of the new markets," Anderson said.

Understanding what users are going to want before they even do is becoming a major factor. A company will also have to understand the strategic plan of its business before its customers can understand what they can do with it, according to Anderson.

Anderson outlined five critical elements necessary to becoming a dominant player in communications: local loop, long haul, communications processing, computer processing and hardware devices.

Why will one company succeed relative to its competitors? "Because that company will build a customer base that is network and computing intensive, because it will be, by integrating toward low cost, a network provider and because that company will recognize the impact of technology earlier than anyone else," Anderson concluded.

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## Snyder Chosen To Keynote AICPA Meet

ATLANTA — David Pearce Snyder, life-style editor of *The Futurist* magazine, will deliver the keynote address at the 19th Annual Computer Conference of the American Institute of Certified Public Accountants (AICPA) to be held Nov. 14-16 at the Waverly Hotel here.

Snyder will examine how computers will impact the accounting profession and the general business environment in the next decade, according to an AICPA spokesman.

The conference will also feature 2½ days of lectures and case studies on computer consulting and auditing skills presented by educators and experts from a number of accounting and consulting companies.

The conference theme of "A Return to the Basics as a Foundation for the Future" was chosen to illustrate that, while computer hardware and software have grown more sophisticated, the basic requirements for using computers in accounting have not changed, according to the AICPA spokesman.

The fee to attend the conference is \$425. More information about registration is available from AICPA's Meetings Department, which is located at 1211 Ave. of the Americas, New York, N.Y. 10036.



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21. Eliminate spelling errors with a built-in Spelling Proofreader.



22. Analyze overtime percentages on your PC, using data from MSA's Payroll/Personnel System...



23. Make timely manpower adjustments to maximize productivity...



24. And review department salary projections on your PC.



25. Download vendor history from MSA's Accounts Payable System...



26. And use PeachCalc to do comparative analysis.



27. Use PeachLink to download information from both MSA and non-MSA online mainframe systems...



28. Create custom online formats with Easy-Screens™.



29. Or use standard formats provided by MSA.



30. Download a financial report from the mainframe to your PC...



31. Add footnotes to a balance sheet using PeachTest...



32. Project next month's income with PeachCalc...



33. Change sales estimates and recalculate income projections instantly.



34. Download names and addresses from your mainframe...



35. Use the List Manager and PeachTest to do a mailing informing customers of a special announcement...



36. Or create a mailing to vendors requesting bids.



37. Using personal computer telecommunications, access up-to-the-minute exchange rate information...



38. Use PeachCalc for float analysis...



39. Display current exposure with a graph...



40. Update MSA's mainframe Foreign Exchange System.



41. Use PeachLink to distribute mainframe data to your other offices across the country...



42. Use a PC at those remote locations to print reports...



43. Graph expenses by location, department or by a single product line...



44. Print checks to remote locations from mainframe Accounts Payable data.



45. Create a salary administration worksheet on a PC using MSA's Payroll/Personnel System...



46. Produce a workforce utilization model using PeachCalc...



47. Monitor turnover using Business Graphics...



48. And, for a printed copy, route your Business Graphics output to a plotter or printer.



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58. Extract delinquent customer invoice information from your Accounts Receivable System...



59. Personalize a dunning letter with your astro software...



60. For help, call up 30 synonyms instantly using PeachTest's Random House Thesaurus.



61. Use mainframe inventory and Purchasing data to graph inventory use by department on your PC...



62. Make a purchase order adjustment without leaving your workstation.



63. Download current balances from General Ledger to graph actual vs. planned...



64. Do a breakeven analysis by department.



65. Analyze overtime percentage by department on the PC using MSA's Payroll/Personnel System...



66. Use PeachTest to prepare a memo summarizing your analysis and attach it to a graph.



67. Download employee data for an upcoming salary review...



68. Complete the salary review on your PC...



69. Enter the salary adjustment from your PC to the mainframe...



70. Make salary projections on your PC using mainframe payroll data.



71. Capture data from MSA's Fixed Assets System...



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# Mini Compiles Marathon Results in Record Time

By David Myers

CW New York Bureau

**NEW YORK** — For Rod Dixon and Grete Weitz, winners of the 14th New York City Marathon last week, the 26.2-mile road race lasted less than two and a half hours.

But for race officials, herding runners through the finish chutes, ripping off their bar-code identification numbers, feeding information to "the Official Computer of the New York City Marathon" and mailing out postcards to the 17,000 runners showing their time and place of finish, the long, rainy race day did not end until after midnight.

By any measure that is a long day. However, in the first 13 New York City marathons, the final tabulation of results and the notifications to participants took anywhere from three days to a week.

Last week, the New York Road Runners Club, sponsor of the marathon, used a minicomputer for the first time to process all the raw data from the race.

The result? Within hours of finishing, the 17,000 runners — 2,850 of them women — all knew exactly where they had finished overall, where they had placed by age and by sex and how fast they had run.

The minicomputer used by the Road Runners Club to track the marathoners was a \$300,000 Qantel Corp. System 64 linked to two high-speed printers donated by its maker, MDS



More than 17,000 runners surge across the Verrazano-Narrows Bridge from Staten Island into Brooklyn at the beginning of the New York City Marathon.

Qantel, Inc., a Mohawk Data Sciences Corp. company.

"What did we have to agree to

get it?" asked Fred Lebow, president of the New York Road Runners. "We promised to call it the Official Com-

puter of the New York City Marathon. But look, Qantel is getting (Continued on Page 34)

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much more done. In less time. Because the MidFrame delivers consistent subsecond response time. What's more, it gives MVS/TSO development programmers advanced interactive processing facilities never before seen in mainframe shops. Things like knowledge-based editors that "know" just what to do. Without being told!

The smart COBOL editor includes automatic syntax checking. Cross-referencing. Formatting. Scanning. Zooming. And more.

There are compound search functions. Undo/redo, too. A powerful, consistent command language that's easily expanded. Plus sophisticated window management—with multiple split screens—for processing and tracking multiple concurrent activities.

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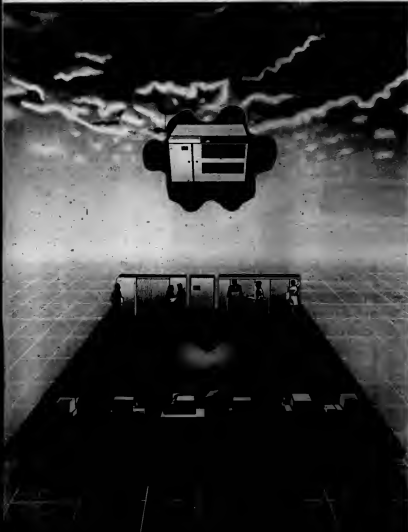
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## Bay Area Dama Chapter Moves Toward Nationwide Status

SAN FRANCISCO — A professional association with a special interest in corporate data administration has taken the first step toward accomplishing its long-term goal of evolving from a regional to a nationwide organization.

The Data Administration Management Association (Dama), which in the past has confined its activities exclusively to the Los Angeles area, has now established its first formal presence in northern California.

On Oct. 14, about a dozen local computing professionals gathered

here in the Bank of America's world headquarters to attend the premier meeting of Dama's emerging Bay Area chapter.

With the advent of its Bay Area chapter, Dama now boasts two main bases of operation: one centered here and the other in Los Angeles, where the association originated about three years ago.

A third such chapter is expected to come into existence "within the next few months" in Seattle, according to David Schryver, immediate past president and current secretary of Dama's southern Cali-

fornia branch.

Schryver also foresees the eventual formation of even more Dama chapters in cities like Phoenix and Sacramento, Calif.

Founded in 1980, Dama aims to advance the emerging field of data administration by providing its members with a forum for exchanging professionally useful information.

More information about Dama's Bay Area chapter can be obtained from Gwynn Davis, Bank of America, Suite 304, 315 Montgomery St., San Francisco, Calif. 94104.

## Marathon's Mini Beats the Clock

(Continued from Page 32)  
something out of it too. You've got 17,000 runners in the marathon, most of them upper middle class, most of them professionals. They are people who buy computers."

Luckily for them, though, Bruce Heifetz and Pamela and Bert Gold had taken care of things before May. Ed Koch had even fired the cannon, starting the runners across the Verrazano-Narrows Bridge. Heifetz and the Golds run HBG Systems, a Valley Stream, N.Y.-based company which developed the software for the marathon under contract to Qantel.

### Procedure for System

When a runner crosses the finish line, a race official records his time. The runner is then steered down a chute by a volunteer who keeps him in the order of his finish and then rips off the bar-code identification number.

The bar-code numbers are gathered into batches and sent to the trailer housing the computer to be scanned by hand via a Computer Identics Corp. FCP22A scanner.

Meanwhile, a select timer punches in as many of the runners' shirt numbers as he can enter. The entries are then compared to the bar-code batches to make sure everything is in the right order, and then the computer takes over.

It's still not as fast as Heifetz, operations manager the day of the race, would like. "We're still relying mostly on people," he said. "That's the unfortunate part."

The hang-up is in the scanners, Heifetz explained. "There is no optical scanner we know of that will handle 180 runners a minute. If there were, we could just attach a bar-code tag to their sneakers," he said.

A week before the marathon, a five-mile race was conducted to test the computer. Most of the 1,963 runners had finished in 45 minutes. But less than 400 participants had been scanned by then. "Man the scanner!" came the message from the computer.

The Qantel System 64 can support up to 100 terminals. It runs a proprietary Qantel operating system.

Qantel donated the system as part of its "big push into sports," a Qantel spokesman said. The company's equipment has been bought by the National Basketball Association's administrative offices, as well as by 14 National Football League teams, he said.

For the New York Road Runners, meanwhile, the computer will serve as more than just a race-day tool. Lebow explained that the club is using the System 64 to compile a data base of the world's best runners and their best times.

"Every marathoner who runs under 2 [hours] 20 [minutes], every miller who runs a sub 3-5 [hour] woman who finishes a marathon in under three hours will be kept track of. The times will be completely up-to-date," Lebow said with pride.

As of last week, the names of Rod Dixon (2:08:59) and Grete Welts (2:27:00) were added near the top of the Road Runners' marathon lists.

## "Radio Shack's TRS-80 Model 100 is an amazing machine."

—Byte Magazine, Page 34, May 1983

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Money magazine said "... the Model 100 is so packed with goodies that it could well become the machine of the year. Just the fact that someone who knows absolutely nothing about computers can sit down ... and in less than 10 minutes be writing letters on it puts it in a class all its own." Read enough? Then get your own TRS-80 Model 100 at your nearest Radio Shack Computer Center or participating store or dealer!

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## TSO Emulation Aids Conversion User Moves From VSE to OS/1 in Four Weeks

RENO, Nev. — For Computing Resources, Inc. (CRI), the time had come to switch operating systems on the company's IBM mainframe.

However, as provider of phone-in payroll services for some of the nation's largest banks, CRI could ill afford a lengthy delay during its recent conversion from the DOS/VSE operating system to OS/VS1 on its IBM 4331 processor. So it set a four-week deadline.

It was not the first conversion for CRI, which supports

over 1,200 payrolls for customers such as the Wells Fargo Bank in California, the nation's 11th largest bank. CRI began operating in 1978 when it purchased the assets of Control Data Corp.'s local service bureau branch. CRI got all the branch's DP equipment and purchased time on a CDC 6400 mainframe.

But the company decided to switch to IBM. "We felt that all our current customers were really IBM-oriented and the same was true for the

people we hoped to do business with in the future. It seemed reasonable that offering IBM compatibility would definitely be an advantage," explained Vice-President Harry Hart, who is also in charge of data processing.

After considering everything from an IBM 360/65 to an IPL Systems, Inc. machine, the company settled on the 4331 as "absolutely the best deal we could have gotten," Hart said. CRI decided to run in the DOS/VSE environment because VSE seemed to minimize the difficulties involved in converting from the CDC operating system (Kronos 2.1).

### Not All They Expected

However, DOS/VSE was not everything CRI expected. "The CDC system we had when we first bought out the service bureau had a very sophisticated operating system. DOS/VSE was very pale in comparison," Hart said.

The firm then looked to an OS/VS1 conversion as a means of getting the capabilities to which it was accustomed. Before actually committing to the conversion, however, CRI personnel researched software enhancements to VSE that might have helped that operating system meet their needs without a costly change.

"When we added up all the prices for DOS system software, it came to a lot of money," Hart said. "And when it was all done, it would still be DOS/VSE."

CRI decided to switch to OS/VS1, Hart recalled, despite the strong disapproval of local IBM representatives, who thought CRI would not be capable of supporting OS/VS1 on the 4331 and that the firm would be unable to perform the conversion in the time it had set aside for the task.

Hart had his own conversion concerns. "VS1 is oriented to a punched-card reader setup, and we had removed our card readers two years earlier. We needed some way to submit and run jobs in VS1 without a punched-card reader. Also, we weren't able to perform the system for the new operating system on our equipment because we needed a card reader for that also."

VS1 also lacked on-line programming support similar to that provided by IBM's TSO.

After exploring a number of options, CRI turned to Tone Software Corp.'s Tone 3 software which, in combination with VS1, emulates TSO. Thus, Tone 3 offered

the necessary programming support and allowed CRI to make use of a variety of other software packages that run with TSO.

Tone 3 also features an "internal reader" capability that enables a user to submit input via terminals rather than through a punched-card reader.

"What's more," Hart said, "the Tone people did the system for us with their hardware in Anaheim [Calif.]. I had been searching around trying to find someplace

with the equipment I needed to do the conversion. I was really losing 'sleep over it. But with their help, we got the system up in just four weeks."

In addition, Tone 3 gives CRI a path to MVS. "We decided between the MVS operating system [during the conversion] because the additional cost of a larger computer, more software and the complexity of maintaining an MVS system just weren't worthwhile. But be-

(Continued on Page 36)

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# Mini Roots Agricultural Firm's Distributed Net

MINNEAPOLIS — Succeeding in the commodities business takes more than silos and railroad cars. For one firm based here, computerization is taking an increasingly important role.

Cargill, Inc. buys, stores, transports and sells agricultural and other bulk commodities on a worldwide basis. "The environment in this business, with its sharp swings in supply and demand, rapid price fluctuations and low margins, is dynamic," observed Gene D. Gross, assistant vice-president to the data processing department.

"We rely on computer technology to help us keep up with it. Our computer sys-

tems must promote efficiency and productivity in operations to hold costs down and also ensure the ready availability of fresh, accurate information critical to effective decision-making at all levels of management."

IBM's Series/1 minicomputer has become a key element in Cargill's large-scale, data processing capability. More than 100 Series/1s are now deployed in a wide-reaching distributed system serving mainly those company divisions dealing with farm products. The Series/1s handle heavy processing work loads at company offices and facilities around the country and also communicate with Cargill's IBM

3081 host processor located at the firm's headquarters here. "We turned to the IBM Series/1s as anchor units in our distributed system for several reasons," Gross said.

## Versatility Cited

"We needed versatile processing and storage capacity because of the large transaction volumes at our remote offices. We had to have communications capability for swift interchange of information between remote locations and headquarters."

Cargill's Commodity Marketing Division is a major user of the Series/1, with 50 included in the network.

"We plan to install another 18 Series/1s this year," said Michael K. McNamara, the division's DP manager.

The Commodity Marketing Division buys food and feed grains and oilseeds from producers, local cooperatives and country elevators; assembles bulk quantities in company elevators and port storage facilities; and ships to customers throughout the U.S. and around the world. A typical office handles hundreds of transactions a day, McNamara said.

The local Series/1 functions as a comprehensive back-office support system, similar to that of a commodities broker. Full details of all

buy/sell transactions are entered into the process via on-line terminals. The system sets up its own local data base records, then tracks each transaction from start to finish, according to McNamara.

At buy/sell transaction data is entered into the system at the local office, the Series/1 extracts and transmits data to the host 3081. The 3081 accepts the transmissions continuously from the local processors and initiates cycle processing of related data from all offices on-line to update its own master data base files. Later, the host transmits back invoice data, control and summary report data and management report data from printing by the local Series/1s. McNamara noted.

"The Series/1 network helps Cargill accomplish what must be accomplished to enable the company to buy and sell effectively, and to handle efficiently the many in-between steps that bring the commodity producer and the commodity consumer together in a mutually favorable transaction," Gross said.

Cargill's oilseed and milling operations also benefit from the distributed Series/1 system. Series/1s are in place now at 15 oilseed crushing

plants, at 10 flour mills and at three corn milling plants, explained Carl Kowing, DP manager for milling and oilseed operations.

The soybean facilities, which also buy from many producer sources, crush the soybean meal, which is a primary ingredient in animal feeds. The local Series/1 also functions here as a support system, handling all accounts, tracking all buy/sell transactions and communicating with the host 3081.

## A Productivity Boost

"Our group's activities also produce heavy clerical work loads which the local computers now quickly handle, boosting productivity and reducing processing costs," Kowing said.

Cargill, its subsidiaries and affiliates have more than 700 plants and offices in 48 countries, employing about 40,000 people.

In addition to more than 100 Series/1s, the firm's configuration includes a 3081, several System 370/166 mainframes, seven IBM mid-range 4300 Series processors, five IBM System/36 processors, 28 System/34 processors, three System/23 processors, five IBM 8100 distributed processing systems and 80 IBM Personal Computers.

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## Package Speeds Switch to OS/VS1

(Continued from Page 35) cause Tone 3 is compatible with MVS TSO, many packages designed to run under TSO can now run on our current VSI system."

Further, the combination of the Tone 3 package and OS/VS1 has resulted in a marked throughput improvement for CRL. "Had we kept DOS/VSE, we would

have had to hire another person to fool with the system or we would have fallen behind in meeting customer needs," Hart said. "Because we did not want to hire more programmers, we had to enhance our system and improve our productivity. The most amazing thing is we have actually increased our throughput by approximate-

ly 20%."

Also, "we used to have Power/VSE problems about once a week under DOS/VSE, which would bring the system. We'd have to shut the system down and bring it back up," Hart maintained. "We haven't had a system hang of any sort since we began running Tone 3 and OS/VS1."

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# Firm Levels Multivendor Barrier With WP Tools

INDIANAPOLIS — Incompatibility due to a multivendor environment was a major barrier for a coal producer which wanted to improve communications among nine mines in Indiana, Illinois and Wyoming and its central office here.

"We had several different types of stand-alone equipment for word processing, and it was impossible to transfer information from one type to another," recalled Joseph Rosio, director of information services for Amax Coal, the third largest coal producer in the U.S.

"Our people weren't communicating, and we were running out of space to store documents. We also needed to establish some centralized control over costs," Rosio said.

During a five-year period, Amax Coal evaluated numerous hardware solutions and found that programming was required to allow communications between different types of equipment. And there was no guarantee that the resulting word processing environment would be effective.

## Word Processing

Two years ago, Amax Coal acquired Applied Data Research Inc.'s ADR/ETC software for interactive word processing on its existing IBM mainframe computer network and later added ADR/Email for electronic mail. Communications improved practically overnight, according to company employees.

"ETC simplified communications so dramatically that it saved us five times what it cost us in its first year of operation," Rosio said. "It allowed us to do more work with fewer people. In areas where we already had IBM terminals, there were no additional start-up costs, other than perhaps a letter-quality printer. Our secretarial and administrative staffs think of it as a stand-alone word processor."

ETC has allowed Amax Coal to standardize manuals and proposals, stabilize reporting procedures and update information throughout the organization.

Among its features are the ability to create standard headings and footings, sorted lists, table of contents, indexes and footnotes, along with its archival, retrieval, and arithmetic calculation capabilities. Tables and charts that had taken several days to compile have been generated in minutes.

According to Vera Hite, supervisor of word processing, "There are several hundred pages in a mine permit.

ETC allows us to enter data and update information faster and easier than before."

In 1982, Amax Coal took another step along the road to improved communications. It became the first user of ADR/Email, electronic mail software that tied into Amax's IBM 4341 II computer under OS/MVS without requiring additional storage space.

With its English com-

mands and terminology common to routine office procedures, Email was popular among middle-level managers who otherwise would not have used a computer terminal, a company spokesman said. Messages that often took five days to reach intended recipients now took a matter of seconds.

According to James Katschwar, warehouse su-

pervisor for the Ayshire Mine in Chandler, Ind., "I can type a message on a terminal and send it out in as little time as making a phone call and then go about with what I'm doing. You often have to make several calls before reaching the intended party. This cuts down on communications costs and provides me with quick and easy information."

Email has also dramati-

cally reduced the flow of paperwork. "You can get on more distribution lists than you know what to do with," Rosio said. "With Email, you can browse through your inbox electronically and sort out what you want to read first. You can make a hard copy if you want or simply delete the messages after reading it. It's a much faster and efficient way of communicating."

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## New Western Union Service Helps Corporate Planners Arrange Meetings

DALLAS — Western Union Corp. has created a data base network that it hopes will take the drudgery out of planning for meetings by making it possible to arrange every detail — from air travel to hotel accommodations — with one telephone call.

Under the system, appropriately dubbed One Call, a meeting planner calls Western Union's Travel Industry Services, Inc. based here. Terminal input operators take down the meeting requirements, such as air travel, hotel accommodations and ground transportation, and enter them into a data base that is currently accessed by more than 200 travel industry suppliers.

Those suppliers, who represent many of the nation's largest hotel chains, airlines and car rental agencies, then enter bids for providing the necessary services. The bids are compiled by the Travel Industry staff and sent to the meeting planner via a

Western Union Mailgram. The planner can then choose among the bids and finalize the arrangements directly with the suppliers.

Suppliers are charged a monthly fee ranging between \$70 and \$150; they also pay a fee ranging from \$25 to \$75 for each successful bid. The meeting planners are required to pay a one-time \$75 fee to create a permanent file in the data base and are charged between \$10 and \$25 for each meeting listed on One Call.

At the core of the One Call system is a fault-tolerant system, a 2M-byte Tandem Computers, Inc. Nonstop II. Some 18 suppliers, spread across the country, are equipped with Tandem terminals for direct telephone access to the data base. The others access One Call via a Telex system or through 3M Corp.'s Whisper Writer desktop printers with 8K-byte memory. Those secondary systems are tied to One Call through Western

Union's Easylink network.

One Call became available in early September, and since that time approximately 125 meetings have been arranged through the system, according to Travel Industry Services President John F. Richard.

One Call is already available to meeting planners within the entire U.S. and much of the Caribbean region. "In our original business plan, we were shooting for 30 suppliers by the end of 1983," Richard said. "We're well over 200 already, and we're beginning to offer One Call to independent hotels in addition to the major chains we've already targeted. We could easily end up with 1,000 suppliers by year's end. The response by meeting planners has been equally positive."

Richard said the system cost just under \$1 million to implement; marketing costs for One Call have been "considerably in excess of that." The project was conceived in 1982, and marketing to suppliers began last April.

According to Richard, One Call was created to take advantage of the technology Western Union already had in place. "Western Union spent well over \$1 billion between 1970 and 1978 developing physical capabilities such as satellites, microwave networks and sophisticated switching equipment. The networks were in place, so we began to focus on product development. There was a definite attitude of 'let's find new products to take advantage of our equipment.' The whole travel industry exploded because of technology, so this technology is a natural fit."

"This is a natural for us," Richard continued. "We already have an extensive communications network in place that we can use at a minimum cost. We also have a very strong marketing system. Also, Western Union is not a travel industry. We are totally disinterested in the outcome of the bidding process. No travel-related industry, such as one of the hotel chains or airlines, could do this. Eastern Airlines, for example, would not feel comfortable bidding within a system operated by American Airlines."

## Directory Lists Service Firms

PALMYRA, N.J. — The recently released "Independent Service Directory" provides information on some 262 independent service companies offering computer equipment services.

The directory provides an alphabetical listing by company name of firms providing service of computers, peripheral, communications and automation equipment; and systems or applications software.

The book also contains a geographic index by state of companies providing on-site services in those states.

Priced at \$19.95, the publication is available from the Service Research Group through P.O. Box 335, Palmyra, N.J. 08065.



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In addition, PCI protocol converters allow your ASCII terminals to emulate 3270 full screen operation. So you can access SPX full screen editors and any utilities available to a 3270. Which means more productive use from your graphics hardware, even when it's not doing graphics.

There are a lot more graphic examples of what PCI protocol converters can do for your graphic devices. So if you've been having communications problems with computer graphics on your IBM system,

let PCI speak your language. Call for a demonstration today.

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## N.Y. Transit Authority Dispatches Inventory Headaches With System

NEW YORK — Did you ever wonder what happens to all the buses on a rainy Friday night in New York City?

Thanks to a newly installed computer system, officials at the New York Transit Authority say they can offer an answer with the push of a button. And if you want to know how many

spark plugs or windshield wipers the authority has in stock, that can be accomplished too. So can a maintenance history of each bus in the city's fleet.

The Transit Authority installed five IBM System/38 processors, along with 104 remote terminals at depots and maintenance yards throughout the city. The sys-

tem, which was installed about a year ago, keeps tabs on the inventory and maintenance needs of one of the world's largest public transit systems.

Vincent Pontillo, superintendent of maintenance operations for the city's bus system, is responsible for maintaining over 4,000 buses that transport millions of New Yorkers every day.

"The whole job used to be done manually. I used to call every depot every morning to find out how many buses were down. Now, every foreman in every depot plugs this information into the system. It's on-line; I have it immediately," Pontillo said.

"I used to run surveys," Pontillo added, asking "how many right-side mirrors are missing? How many fare boxes are broken? I'd put three or four guys on these surveys, and it would take them forever. Now, it's all in the system. I have more accurate information, and it takes fewer man-hours to get it."

The Transit Authority is also able to identify fleet defects quickly, he noted, citing the case of the "cyclops bus" — new buses that had only one working headlight. With the computer data at his disposal, Pontillo was able to prove that more than 20% of the buses had defective headlights. "When a defect shows up in more than 20% of a new fleet," Pontillo said, "it's the manufacturer's responsibility, not ours, to repair it at considerable savings to the Transit Authority and its patrons."

Charles Casano, the Transit Authority's assistant supervisor of the East New York Base Shop in Brooklyn, said there may be greater benefits to using the system in the future.

"We already know more about the buses we're servicing now than we used to. But in the future, we'll be able to do things like track the fuel consumption of each bus, improve mileage and fuel efficiency and save our riders money," Casano said.

As more System/38s and more remote terminals come on-line (six more System/38s and 450 terminals are being sought), the opportunities for better fleet management will become even greater. Managers will be able to track major repetitive problems and seek long-term solutions. Scheduling will improve. So will development of man power. Ultimately, the Transit Authority is confident that through automation, it will overcome "problems in image and performance."

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# Package Enables Insurer to Manage Policy Data

COLUMBIA, S.C. — Storing information for 1½ million policies as efficiently as possible and protecting the data from loss and unauthorized access is a task that the data processing department at a growing insurance company here has accomplished with software.

In pursuit of aggressive growth goals, Colonial Life Insurance Co.'s DP needs burgeoned. "Today our policy master files alone take up three of our 32 IBM direct-access storage device [DASD] drives," noted Randy Barnett, systems programmer and security administrator.

For DASD space management, Colonial Life's DP department acquired Pac/Master, from CGA Software Products Group, Inc. of Holmdel, N.J., in June 1980. The software assists Colonial Life programmers in transferring to tape on a daily basis 30-day-old data and temporary data that are no longer needed.

Weekly, all partitioned data sets are compressed automatically. "Pac/Master has definitely saved space by condensing the data," Barnett said. "That means a cost savings in disk drives."

## Protecting the Data

In addition to storing the data, the company also had to address the problem of protecting the stored information. "To lose even some of that information or our ability to process it would cost us quite a bit," Barnett said.

Colonial Life's physical security precautions include surveillance cameras, security personnel, badges and agreements with other data centers to keep information backup.

One concern in selecting a software security product, Barnett said, was that it should be able to handle every aspect of security for all systems, from various on-line systems to different vendors' software packages. "It had to be flexible so that any decision we made one day could be changed at a later time," he added, explaining that Colonial Life is currently converting from an IBM 3033 mainframe to an IBM 3091G. "For example, we recently replaced CICS with IBM's IMS. Because we're installing it in phases, we must be able to build the security on what's already there."

CGA's Top Secret package was selected and was installed in October 1981. Barnett said Colonial Life obtained the package during its early production stage and was able to work with CGA to build in enhancements.

Top Secret uses the security interface built into MVS. No changes to the operating system are made, so compatibility with other MVS-related software is assured, Barnett said. "We'll use these interfaces to

check authorization for a user to update a specific record in a data base," he observed. "For example, a user will be able to read a data base, but only update those parts he's authorized to update."

Colonial Life has 250 IMS terminals spread throughout two buildings. "Initially we used a package which secured only TSO, it was very difficult to modify because it required an initial program load. Top Secret can be used across our entire system. We currently use the product for IMS, TSO and batch security," Barnett explained.

Top Secret's gradual implementation allowed Colonial Life to secure the essential applications while defining the other systems. In dormant

mode, Top Secret was installed, but it did not actively control access. The warn mode was set up not to warn the users, but to enable Barnett to test his definitions. By checking his daily reports, he could determine if each violation was a true violation or a definition error; this allowed him to refine his security file without arousing users.

Colonial Life then moved to the fail mode, where access to unauthorized files is denied and the administrator is made aware of the violation.

"Top Secret is efficient," Barnett said. "It's not necessary to write a lot of exits which take up programmers' time and resources, where you end up doing a lot of work to get something out of it."

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WASHINGTON, D.C. — The First Annual 1100 Data Center Management Conference will be held Nov. 2-4 at the Crystal City Hyatt here. The conference will be of appeal interest to DP directors, managers of computer operations and management personnel of large and small Sperry Corp. Sperry 1100 sites, according to the conference sponsor, Datametrics Systems Corp.

Speaker seminars will address issues such as disaster recovery, security, personnel management, environmental planning and control, motivation, capacity planning and maintenance.

Vendors of hardware and software products and services compatible with Sperry will display their products and provide information at a vendors' reception.

Registration is \$395. Further information is available from Datametrics, Suite 201, 9940 Main St., Fairfax, Va. 22031.

Not so long ago, most companies believed that any information problem could be solved by adding another computer.

And another.

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## In Place Since '76

## Local Net Keeps School Bus Maker on MRP Road

FORT VALLEY, Ga. — In the early part of this century, school buses were constructed almost entirely of wood. But they did not last long on the wet dirt roads that dominated most of the country's rural areas.

A. L. Luce, founder of the Blue Bird Body Co., had an idea for constructing a sturdier and more reliable bus — one that would survive the wear and tear of the rugged Georgia countryside. Originally the owner of a Ford agency in Perry, Ga., Luce was able to fabricate an all-steel bus body and mount it on a Model T chassis in his Ford garage.

As the news of his innovative achievement spread, Luce soon found himself in the business of building buses. Today, Blue Bird Body Co. is the leading manufacturer of school buses in the U.S.

Production activities of Blue Bird over the past decade have grown dramatically — it currently operates several assembly plants, and the company's product line has grown to include small shuttle buses, large transit buses, city passenger buses, luxury motor homes and the familiar yellow school bus. The company credits its continued growth partly to the real-time processing power provided by a Datapoint Corp. Attached Resource Computer (ARC) local-area network, that has been in place since 1976.

According to Blue Bird, the biggest benefit of the ARC local network is reflected in its production ability. The company has been able to increase the number of buses built without a proportional increase in inventory investment.

George Will, DP director for Blue Bird, recalled that the company began using computers in 1970. Later the need for real-time tracking prompted Blue Bird to look at various computer offerings. Initially, the company wanted to update the mainframe then in use, but decided it would be too expensive.

It settled on an alternative: real-time processing power with a less expensive Datapoint 5500 minicomputer that could share processing with the existing IBM 370/133.

According to Tom Morroil, a programmer at Blue Bird, in 1975 the company decided to implement a materials requirement plan (MRP) — a move that necessitated augmenting its IBM 370. Blue Bird decided to augment the system with Datapoint equipment consisting of two file processors, eight applications processors connected to the network and four 70M-byte hard disk drives. The applications processors have eight to 16 CRT terminals connected to them.

As more and more of the applications originally assigned to the mainframe were put to the test on the Datapoint equipment, the power of the ARC local-area network became evident.

"The move began with our inventory control system," Will noted. "We took the whole inventory, including all materials movement, and switched it from a batch-type operation to real-time processing on Datapoint equipment. This enabled us to track parts from the initial setup to completion of the part and its movement to the warehouse."

By 1978, the company was using the Datapoint ARC local-area network as the primary real-time computer system. "At that time, the ARC local network was far ahead of anyone else in the field," Will said. "Datapoint equipment is also used in our branch plants in Iowa, Virginia and

Canada. It enables us to maintain a corporate materials requirement plan — a very effective tool in our industry."

Because the ARC local-area network provides shared resources throughout the company, all offices have access to a total inventory plan, making it possible to know what has been shipped and what is on back order. It plays a key role in keeping branch assembly plants operating with a minimal amount of inventory.

Today the company has installed 10 Datapoint processors: Datapoint 600s, 6600s and 6000s, along with 60 Datapoint CRT terminals consisting of Model 3600s and 8200s.

According to Will, the dependability of the ARC network allows the company to handle numerous tasks involving over 1,000 applications programs, which include inventory control, shop floor control, payroll and data gathering and editing, which is then fed to the mainframe via magnetic tape.

"Our current Datapoint system is a vital part of our data processing needs today," Will noted. "Demands made on our ARC system are much more rigorous than on the mainframe. We can afford to have the mainframe go down for a few hours, but we can't afford that with our ARC local network."



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## Handles OA Applications

## Supermicro Eases End-User Tasks at PR Agency

SAN JOSE, Calif. — Three years ago Franson & Associates, a public relations firm here in Silicon Valley, had three employees and one small personal computer.

Today, the company has grown some 1,000% to reach its current staff of 30 and has expanded its client roster from three to 25 accounts. Committed to productivity through office automation, the agency recently installed a multiuser, multiprocessor microcomputer.

With the new system, employees can write their own memos, letters and articles, update mailing lists and make final revisions on news releases and articles from their desks.

The agency had been upgrading its office automation system continuously to keep pace with its growing client and employee roster. Before the multiuser system was purchased, the agency used three nonnetworked microcomputer systems, each equipped to communicate with four users. But by early spring of this year, several problems with the configuration of the computer system surfaced.

"The most obvious problem was that we were running out of terminals for employees," said Paul Franson, president of the firm. A more subtle but no less frustrating discovery was that when all four users were

on one computer, the entire system would slow down significantly, he added.

Moreover, because the three computers were not networked, diskettes had to be changed physically when data was exchanged between computer systems, adding further delay to everyone's productivity. "It always seemed we were just one system behind what we needed," Franson said.

Last spring, the company's management researched a number of alternative office automation solutions. The agency chose a multiuser, multiprocessor supermicro system that would not degrade in power as

more users were added to the system.

The system, a Supermicro 32 from Molecular Computer, Inc. of San Jose, Calif., is geared specifically to users in small to medium-size companies as well as departments in large organizations. The multiprocessor configuration reduces performance degradation, a problem associated with shared-logic computer systems such as minicomputers.

After acquiring the Supermicro 32, the agency first networked 16 users. As growth continued, Franson linked all 30 employees to the system. "We chose the Molecular system because it provided our company with an incremental solution," Franson observed.

Since installing the Molecular system, the agency has implemented an electronic mail service, enhanced its word processing and accounting packages and expanded its mailing list programs.

The cost per user of the system, including the computer and application processor boards designed with a dedicated microprocessor for each user, was less than \$2,000, Franson said.

Four printers are connected to the system. Two are used for letter-quality printing, with one dot matrix printer for spreadsheets and art/other for rough-draft printing.

Each office is equipped with RJ-11 modular telephone jacks connected via a patch panel to the computer system. These jacks make it possible to move any terminal to any office. The terminals are Wyse Technology, Inc. Model 100s, sold by Molecular as MT-100s, Franson said.

An OZ 212 modem from Tri-Data Products, Inc. is linked to the system to allow employees to use terminals at home or on business trips, to access external data bases and to communicate to clients and publications.

The employees at Franson & Associates are happy with the new system. According to business manager Chris Soden, who uses a spreadsheet program daily, the difference is enormous. "When three other people were on the old system, I used to wait up to 20 seconds for the computer to recalculate columns," she said. "With our new system, I don't have to wait more than a second."

Stevan Leonard, a Franson computer specialist, noted that a collision detection method is built into the Molecular system to reduce overhead automatically. A Zilog, Inc. Z80-based central file processor that handles all I/O is located within a local-area network in a box.

As more users are added to the system, additional application processor boards are simply inserted into the back of the system cabinet to provide each user with a dedicated microprocessor.

In addition, Molecular's N/Star operating system performs tasks independently on each user's terminal. Because the Supermicro 32 is configured as a local-area network in a box with the high-speed M/Bus interprocessor link rather than as a network linked with coaxial cable, the response time for each terminal is faster, Leonard said.



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## Anticipating DP Execs' Concern

## IBM Adds Two Classes to Institute

NEW YORK — Apparently anticipating some concern among DP executives about how to manage mainframe and microcomputer resources, IBM has added two courses — "Managing Personal Computing" and "User Computing: Planning for Productivity" — to its Systems Management Institute courses.

"Managing Personal Computing" is a 2½-day course for the information systems executive. Developed to provide a background in nontraditional ways of delivering computer processing capabilities to the end user, it will also deal with implementation and management control issues.

The course, whose code is W9944, will be given Dec. 12 in Chicago, Feb. 28 in Los Angeles and March 13 in New York. The tuition fee is \$620.

More information about this course can be obtained from the IBM Systems Management Institute at 19th

Floor, One IBM Plaza, Chicago, Ill. 60611.

"User Computing: Planning for Productivity" is aimed at department managers. Its objective is to give managers the information necessary to formulate an information processing plan for their departments.

The course will present the characteristics and management issues associated

with various methods of information processing. It lasts 2½ days and costs \$640.

IBM said go dates have yet been set for this course, whose code is W9945. More information on "User Computing: Planning for Productivity" can be obtained from the IBM Systems Management Institute at 5th Floor, 355 S. Grand Ave., Los Angeles, Calif. 90071.

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## Intro Course Targets IBM Micros

NAPERVILLE, Ill. — Deltak, Inc. has introduced a video-based "PC Starter Kit" for the computing novice with an IBM Personal Computer.

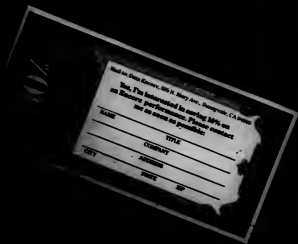
"How To Get Started With Your IBM PC" and "How To Use Software On Your IBM PC" two courses produced by Deltak Microsystems, Inc. in conjunction with Kennan Publishing of Mill Valley, Calif., constitute the "PC Starter Kit."

The first course instructs students on computer fundamentals — what a computer is and how it works, system assembly, keyboard use and control, how to "start" IBM's PC-DOS and why it is important. The second course teaches students how to get data from disks and save work, learn what software is available and do rudimentary Basic programming.

Requirements for users of the two-course kit include access to a television monitor and videocassette player, an IBM Personal Computer with a minimum of 64K bytes of memory, at least one diskette drive, an IBM video terminal, a PC-DOS diskette, a diagnostics master diskette and a blank diskette.

The price for the kit is \$150; each course sells individually for \$75 from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

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A black and white photograph of a man in a dark suit, white shirt, and patterned tie. He is holding a large, rolled-up document or blueprint with both hands. He is looking down at the roll. The background is an office environment with a desk, a computer monitor, and some papers. The lighting is dramatic, with strong highlights and deep shadows.

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confident about every detail in five or six seconds. With VAX systems we've got the answer,  
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### Week of Nov. 13

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Structured Programming in  
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Inc., 1133 Ave. of the Ameri-  
cas, New York, N.Y. 10036.  
Nov. 14-16, Baltimore —  
Personal Computers and  
Networking. Contact: Cen-  
ter for Advanced Profession-  
al Education, Suite 110, 1820  
E. Carry St., Santa Ana, Calif.  
92705.  
Nov. 14-16, San Francisco

— Data Communications II  
System Design. Contact:  
Business — Communications  
Review, 950 York Road,  
Hinsdale, Ill. 60521.

Nov. 14-16, Anaheim,  
Calif. — Structured Analysis  
for Users. Contact: Youdon,  
Inc., 1133 Ave. of the Ameri-  
cas, New York, N.Y. 10036.

Nov. 14-18, Washington,  
D.C. — Basic Systems Analy-  
sis. Contact: Association for  
Systems Management, 24587  
Bagley Road, Cleveland,  
Ohio 44138.

Nov. 14-18, Chicago —  
IDMS Application Pro-  
gramming. Contact: Kaeren  
Perez, Comped, 10 E. 21st St.,  
New York, N.Y. 10010. Also  
being held Nov. 28-Dec. 2 in  
Philadelphia.

Nov. 14-18, Houston —  
Structured Data Base Design  
Workshop for 1983. Contact:  
Learnmonth and Burchett  
Management Systems, Inc.,  
Suite 320, Dresser Tower, 601  
Jefferson, Houston, Texas  
77002.

Nov. 14-18, Reno, Nev. —  
Systems Analysis and De-  
sign Workshop. Contact:  
Youdon, Inc., 1133 Ave. of  
the Americas, New York,  
N.Y. 10036. Also being held  
Nov. 14-18 in Phoenix.

Nov. 14-18, New York —  
CICS/V5 Command Level  
Programming. Contact: Tel-  
tech, 39 Broadway, New  
York, N.Y. 10006. Also being  
held Nov. 28-Dec. 2 in New  
York.

Nov. 14-18, Portland, Ore. —  
Structured Analysis/De-  
sign Workshop. Contact:  
Structured Methods, Inc., 7  
W. 18th St., New York, N.Y.  
10011.

Nov. 14-18, New York —  
Vsam File Management.  
Contact: Kaeren Perez,  
Comped, 10 E. 21st St., New  
York, N.Y. 10010.

Nov. 15, New Haven,  
Conn. — The Fourth Meet-  
ing of Focus Users of New  
England. Contact: Timothy  
F. Scudder, Chenebrough-  
Ponds, Inc., 55 Merritt Blvd.,  
Trumbull Industrial Park,  
Trumbull, Conn. 06611.

Nov. 15-16, San Francisco —  
IBM CICS/V5 Systems  
Design Concepts. Contact:  
Datapro Research Corp.,  
1805 Underwood Blvd., Del-  
ran, N.J. 08075.

Nov. 15-16, Cary, N.C. —  
SAS Procedure-Writing  
Course. Contact: SAS Insti-  
tute, Inc., P.O. Box 8000,  
Cary, N.C. 27511.

Nov. 15-16, San Francisco —  
Introduction to the Tools  
of Structured Analysis. Con-  
tact: Youdon, Inc., 1133 Ave.  
of the Americas, New York,  
N.Y. 10036.

Nov. 15-17, Columbia,  
Md. — Structured Analysis  
and Design Seminar. Con-  
tact: McCabe and Associates,  
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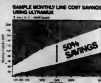
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## Calendar

Knolls Road, Columbia, Md. 21045.

Nov. 15-17, Houston — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 15-17, Columbia, Md. — **Software Quality Assurance Seminar.** Contact: McCabe and Associates, Inc., Twin Knolls Professional Park, Suite 111, 5501 Twin Knolls Road, Columbia, Md. 21045.

Nov. 15-17, New York — **Data Communications, Network, Design and Optimization.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 15-17, Boston — **SNA Architecture and Implementation.** Contact: George Hankel Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Nov. 15-18, Los Angeles — **Software Project Management.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405. Also being held Nov. 29-Dec. 2 in Boston.

Nov. 16, New York — **Files on the Unit System.** Contact: Structured Methods, Inc., 7 W. 118th St., New York, N.Y. 10011.

Nov. 16-18, Providence, R.I. — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Nov. 16-18 in Honolulu.

Nov. 16-18, Washington, D.C. — **Computer Performance Measurements and Capacity Planning: Tools and Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 16-18, Chicago — **Software Quality Assurance.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 16-18, Baltimore — **Data Communications: An Intensive Introduction.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Nov. 28-30 in Phoenix.

Nov. 16-18, Ottawa — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Nov. 16-18, San Francisco — **Power of Personal Computers.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 16-18, Dallas — **MI-**

crocomputer Data Base Management Systems. Contact: Software Institute of America, 339 Salem St., Wakefield, Mass. 01880. Also being held Nov. 28-30 in Los Angeles.

Nov. 16-18, Chicago — **Information Center Concepts: Organization and Implementation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.



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## EDITORIAL

### Unleash a Watchdog Agency

*Given that we depend on other agencies, we feel that it is only fair to give them access to our information.*

— A spokeswoman for the Selective Service

The government owes us all a better explanation for why it will begin comparing its draft registration records against lists of fathers who owe child support payments [CW, Oct. 24].

Thus far, the Selective Service claims it is only complying with the law in implementing the computer matching program in conjunction with the U.S. Department of Health and Human Services. Though it admits this use of computer matching is likely to dredge up few absent fathers, the Selective Service sees the program as a wonderful opportunity for one government hand to wash the other. Having used data compiled by other federal agencies to track down draft registration evaders, the Selective Service is now more than happy to open its files in return.

That rationale cleverly ignores a number of important issues: Should information collected for one purpose be used in very different ways? Does the goal of increased government efficiency justify uninvited intrusion into the personal histories of private citizens? What protection or recourse is available to those who will inevitably become the targets of investigations spawned by errors in the matching process?

Doubtless, there are situations in which computer matching is a legitimate, perhaps even necessary, tool of government. But opportunities for abuse and misuse also exist. A set of stringent guidelines and an independent agency to see that those standards are upheld are necessary.

Perhaps the federal government would do well to follow the example of New York. There an independent watchdog agency — the Committee on Open Government — oversees compliance with the state's new Personal Privacy Protection law. Though the committee has no real power, its privacy impact statements regarding the proposed uses of computerized information by state agencies are upheld by the courts.

It is time to implement a similar system of oversight on a national level. Along with the access the government has to detailed information about every facet of our lives must also come accountability.

## DATA PAST

### Five Years Ago Oct. 30, 1978

ATLANTA — IBM combined its latest memory technology with enhanced logic circuitry and previously unavailable operating software and created a general-purpose system that provided an upward expansion path for users of the firm's System/3 and System/34 processors. The advances were described as up-per-end additions to IBM small business systems.

### Ten Years Ago Oct. 31, 1973

LOUISVILLE, Colo. — The 8000 series disk storage subsystem from Storage Technology Corp. was unveiled as a replacement for the IBM 3380 disk subsystem in applications where users have high data volumes with medium data accessing activity.

WASHINGTON, D.C. — The elevation of Robert H. Bork to acting attorney general and the resignation of Elliot L. Richardson and firing of William D. Ruckelshaus brought about psychological changes in the U.S. Justice Department's Antitrust Division.

WASHINGTON, D.C. — Former President Jimmy Carter's proposed 7% lid on salary increases was expected to cut into most DPs' earnings.



## LETTERS

### Raise Bit/Sec Rate

There are several methods to help to eliminate the types of "hackers" described in "Hacking: Mark of Genius or Plain Theft?" [CW, Sept. 12] and related articles.

I would like to suggest one very simple thing that may help: Raise the bit/sec rate.

Replacing existing modems (300 and 1,200 bit/sec) with 2,400 or 4,800 bit/sec modems substantially reduces the number of hackers that have equipment that is capable of breaking into the system.

One may even recover the cost of the new equipment through improved response time and reduced line charges.

Despite popular misconceptions, modems are available for dial-up lines that will operate as high as 9,600 bit/sec.

Mark Higgins  
Manager  
Computer Systems

Gold Kist, Inc.  
Atlanta, Ga.

### Hacking Not a Way of Life

Contrary to what is stated in "School Invites Hackers to Break Into Its System" [CW, Oct. 3], students at Western Washington University in Bellingham, Wash., are not invited to break into the school's computer systems.

The Statement of Standards posted conspicuously in terminal rooms states that "Vandalism of either hardware or software; unauthorized use of private, group or system files; or actions that tend to obstruct or harass others in their use of the system are discouraged and will lead, at the very least, to the offender's being denied access to the system. Offenders may also be subject to penalties for violation of the Academic Code under the Student Rights and Responsi-

bilities Act (WAC 516-22-020) and codes as appropriate for other constituencies.

Those of us who help to administer the system feel that the abuses received from students may be a result of the concluding paragraph in the Statement of Standards: "If you know of system bugs or weaknesses which can cause the system to fail, make it difficult to protect the privacy of existing files or allow unauthorized access to system software, please let us know about them to help strengthen the system."

Hacking is not a way of life at Western Washington University. Cooperation is.

Joan Lauer Hayes  
Coordinator of Academic Services  
Computer Center  
Western Washington University  
Bellingham, Wash.

### Supplement to Studies

As a new subscriber and a student of information systems, I find *Computerworld* indispensable. Each week brings a wide selection of articles on subjects that supplement my studies.

I do agree with many professionals that DP security is of utmost concern. Firms that have been lax in the past will now have full staffs devoting time to keeping an eye on who is using the systems and for what.

I am in favor of not prosecuting hackers who do not criminally use the system. These people should come forward with their knowledge and work with the owners of the penetrated system so that it may be improved for future protection.

New topics such as these are not covered much, if at all, in my classes. Reading *Computerworld* is a challenge that I enjoy each week. It should be required reading for any student bound for the DP profession.

Kristin Steen  
San Diego, Calif.

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## LECHT ON SCIENCE/Charles P. Lecht

## Of Hacks and Hackers

Maybe this time the national TV coverage was worth it. We got to see a real, honest-to-goodness, close-up look inside the works of the curious swarming beast, crania politica, live, as life itself and lively as only prime-time news revues could make it. Like an armor-piercing missile, the idea that computer-induced mischief could actually be afoot in our newly deregulated communications network environments found its mark deep within the usually impenetrable collective neuronal tangle of a congressional subcommittee, visibly moving its members to uncontrollable synaptic discharge. On color TV sets, the least psychic viewer could see an aura, in the shape and hue of the NBC peacock's tail, arise from the head of each of the worthies as the light of recognition dawned upon him.

The committee was conducting an "investigation" into an August 1983 incident that involved the unauthorized accessing of basically non-secure files in places like the Los Alamos Federal Laboratory, Los Alamos, N.M., by an adolescent hacker. That boy's curiosity for temerity, depending on your point of view) switched on a veritable Pandora's boob tube upon which materialized the depressing spectacle of political scoundrels picking the flesh from the bones of childish pranks. This sight was all the sadder as those pranks had little of the meat of cleverness upon their meager frames to begin with.

Naturally, articles and correspondence in both the general circulation and trade press focused on the kid who "did it," alternately applauding and condemning him. But what are we to make of the committee that

*'Articles and correspondence in both the general circulation and trade press focused on the kid who "did it," alternately applauding and condemning him. But what are we to make of the committee that made him into a national hero for having embarked on nothing more or less than a criminal path of electronic intrusion? And how do we explain to our kids that crime doesn't pay when, upon completing his simplistic, pompous lecture before a group of credulous politicians on national TV, he was actually thanked for having rendered a valuable service to his country?'*

made him into a national hero for having embarked on nothing more or less than a criminal path of electronic intrusion? And how do we explain to our kids that crime doesn't pay when, upon completing his simplistic, pompous lecture before a group of credulous politicians on national TV, he was actually thanked for having rendered a valuable service to his country? This created such an appalling tableau vivant — a modern vision of the hacker leading the hacks — that the criminality of his acts, admittedly amateur, seemed positively benign by comparison.

The seriousness with which those computer hounds upon the errand youth's works, the gratitude with which they welcomed his inept testimony, betrayed the depths of their ignorance about the kinds of problems Americans will have to resolve as society continues to automate. For they clearly could not recognize that what he had to say was every bit as shallow as the hacking itself was inept, and their posturing was sleazy.

Who were these technological illiterates to feel they had the right to hold up to ridicule the achievements of our scientific and business communities in making data communications power accessible to anyone smart enough to flip a terminal's on/off switch? Were they the same legislative and ethical paragons that approved dial-a-sex as a legitimate use of communications networks for anyone capable of dialing a telephone? That hacking is made easier as access is improved should surprise no one — so is robbery as we lay new highways to our doorsteps. Should we feature the latest "successful" crook displaying his booty on prime time before an obsequious congressional committee and tarnish the reputations of our road builders by drawing America's attention to the ways in which their achievements can be put to perverted use by juvenile delinquents and other assorted social misfits?

Anyway, the committee had to be aware that responsible American scientists have been sounding the alarm

on computer security for years, that genuine experts in the field have published reams of articles and spoken until blue in the face on the subject and that the attention of our elected officials had, indeed, been solicited many a time, but could not be directed into public discussion of the issue until a spectacular "vehicle" deposited it under their rosy red noses.

## Life 'on the Set'

Perhaps the warnings of the real experts were expressed in terms that members of Congress could not understand until an errant child offered them an explanation. Or maybe it's just life "on the set" in D.C. these days. I, for one, would prefer not to believe that the committee could only be roused to direct attention to the pointless despoliation and puerile rationalizations of an adolescent highwayman on our communications beltway. No, I think we must look elsewhere if we are ever to understand what our esteemed elders were up to, and I propose now to offer my own speculations.

One might at first be tempted to blame our frustrated Federal Bureau of Investigation, although I think they're "clean" on this one. Still, unable to get the Senate to acknowledge the existence of fire without first administering 100 left and 100 right hot feet and feeling themselves under the increasing pressure of technological change, it's just barely conceivable they decided to add themselves to this historic moment of hard-earned money.

You would expect the late charges of L. Patrick Gray to recognize the (Continued on Page 54)

## HUMAN CONNECTION/Jack Stoner

## Credibility of DP Sales Reexamined

My article "Shabby Sales Tactics Threaten DP Credibility" [CW, Sept. 12] brought forth some strong words from readers.

Joel Robinson of Toronto said, "Usually I find your column right on the mark but your critical opinion of the NEC Information Systems, Inc. Advanced Personal Computer software promotion was way off."

In today's market, software at the retail level is overpriced. For example, Micropro International Corp.'s Wordstar, with its options sells for over \$500. However, if the computer manufacturer buys it in bulk, it will cost him somewhat less than \$50. Would you rather the manufacturer keep the profits all to himself or pass the savings on to his customers?

"The concept of bundled software included at nominal cost has sold many machines for Osborne Computer Corp., Kaypro, Inc., Sanyo Systems Corp., and others. I would be pleased to see NEC bundle permanently rather than on limited time offers. But anytime is better than no time."

"As a consultant, I have installed a number of NEC Advanced Personal Computers. They have proven to be of superior performance and capacity than others, including the IBM Personal Computer."

"In one case, the 'free' software was the deciding factor for the client; an IBM Personal Computer would have required purchase of the same [software] products at their [list] selling prices."

"I suggest you open your mind to the bundled concept. It can be the best investment you can make in today's computer market."

## Top-Notch Marketing Idea

Perhaps my expressions in the article were not explicit enough. I happen to believe that software bundling is a top-notch marketing concept, and the practice will surely be continued and expanded by most vendors as they enter the battle with IBM for a share of the personal computer market.

Where I get off the track is that the advertising distorts the facts when it

pushes over \$2,000 worth of "free software." Everybody knows the software isn't free and that its cost is obviously buried into the price of the bundled machine.

Who is kidding whom? Why shouldn't the test state accurately that volume purchases of software have reduced the cost to the manufacturer, who is, in turn, passing the savings on to the consumer?

## Credibility as DP Professionals

Ernest R. Gillespie of Carleton, Va., said, "I read your article... seeking insights to our credibility as DP professionals. You seem to be saying that the entrepreneur — in your words hawkers and discounters — have somehow distorted what otherwise would be a great idea by overselling their products. These methods of selling have contributed to the 'low-cost computer industry'... sinking rapidly. I don't agree."

"It was the computer professional, or at least some of them, who first sold the micro. I remember well the presentations, magazine articles and

even some conferences where technical computer professionals were predicting a computer in every home. I also remember several friends getting very anxious about home computers. It would be great if the 'home' would balance their checkbooks, and 'make menus flash on a television screen.' What a waste of hard-earned money."

"No, the shortfall in sales of micro, home computers, personal computers or whatever you call them has a direct relationship to their utility for the ordinary person. Our high-tech hype has dazzled these folks far too long. Give them tangible benefits, or even just promise them such benefits, and they will beat a path to your door."

I think we're saying the same thing in different ways. There aren't enough benefits in the personals to justify the current prices for home use, and consumers have become very wise to the advertising hype. Most will continue to defer buying decisions until machine prices come into line with their value.

GETTING AHEAD IN DP/Donald J. Berardo

# How to Handle DP Team Members in Trouble

A project review date is coming up, and as project leader you find yourself in an uncomfortable position. It is uncomfortable not only because the project is running late, but also because the reason it is running late is that one of the project team members has not been pulling his weight, due to a personal problem. This person has confided in you and has asked that the information not be shared with anyone else.

Meanwhile, the review date approaches, and you seem caught between a pair of equally distasteful alternatives:

- You can protect the team mem-

ber's confidence in you and absorb the blame yourself.

- You can relate the problem to your boss in an effort to explain the delay.

These are the immediate alternatives, and each has potential results worthy of consideration.

In the first case, you will unnecessarily look bad in your boss' eyes and will probably hurt your position with the boss, at least temporarily. It will certainly cause you anxiety and possibly some animosity toward the team member with the problem, which is probably the last thing that person needs.

The second alternative has double-barreled drawbacks. On one side, the boss could perceive you as a back-stabber or complainer or both.

On the other side, it could get back to the team member that you betrayed his confidence. Then you face the prospect of dealing with an angry person who already is under some emotional stress.

What would you do?

A solution to this problem can be outlined on two levels: There's the general approach, which can be applied to this and many other situations, and the specific approach that applies to this one situation.

Start by asking yourself, "How do I want to look when this is over?" Obviously, you want to look just the opposite of what the events are setting you up for. You want to come out looking dependable, responsible and trustworthy.

How can this be accomplished? Just as problems are separated from symptoms in systems analysis, the problem can be separated from the person in this case. Determine in your mind just how much of a problem you can relate to your boss without identifying which team member is involved. This could vary from a detailed account to just stating that one of the team members has a personal problem.

Next, determine what you and other team members are capable of and willing to do to make up the lost time and how long it will take to get back on schedule, if possible. If this seems impossible, estimate what resources would be necessary to return to schedule.

Review dates are for good news or, at worst, minor problems you have well in hand. In this case, you should go to the boss as soon as the issue is clear in your mind and you have been through the "last things first" thought process.

Now you can go to the boss to outline the situation, explaining why you can provide only so much information, offering to pull some extra weight and assess the alternatives if that isn't sufficient.

How will you look to the boss now? You should look:

- **Responsible.** You came in with some other alternatives before it was too late.

- **Dependable.** You offered to carry some extra weight to get over the hump.

- **Trustworthy.** You didn't betray a confidence (a fact that may bring you into the boss' confidence at some later date).

Those are the specifics of this case, but you can apply the generalities to many situations.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

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## LETTERS

## Understandable Programs

In the article "Defense's Implementation of Ada Evaluated" [CW, Sept. 12], Jerry Sitrer admits that Cobol has within it the means to be written understandably and that if a Cobol program is not understandable, it is not the fault of the language.

I myself, have had the displeasure of trying to make sense of incomprehensible data names and convoluted logic.

Sitrer then claims that Ada is inherently unclear. I have studied Ada and, like any other language, once the concepts behind the language and use are understood, the language itself becomes easy to read.

Ada programs, like Cobol programs, can be written using unclear data names; that's just bad programming and not the fault of the language.

Sitrer is blaming Ada for his lack of even basic knowledge of the language and the conventions of its constructs.

I find that use of Ada contributes to understandability, and most of the Ada programs I have seen and written as exercises were highly readable.

Martin M. Waxman  
SRS Programming Reserve  
New York, N.Y.

## Credit Card Chase

Jack Stone's article, "Concern Mounting Over Data Controls for Credit Reporting Agencies" [CW, Aug. 1], on credit bureau abuses really hit home.

I attempted to obtain a credit card from Phillips Petroleum. I was turned down, based on a credit report from a credit bureau in Camden, N.J., about 100 miles from where I live and work. The report was in-

complete, full of errors and illegible. Phillips could not give an acceptable reason for not dealing with a credit agency closer to my home. After many phone calls to the Camden agency, and considerable aggravation, I decided I didn't really want a Phillips credit card after all.

Susan Bunting Bianchi  
Manager  
Corporate Research  
Pennsylvania Blue Shield  
Camp Hill, Pa.

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## Committee on Hacking: Lights, Cameras . . .

(Continued from Page 51)

makings of a spellbinding soap opera when they saw one. Well, here came Mary Hartman, Mary Hartman with a vengeance: a group of slightly overdone apple-pie kids breaching security, then going straight with all the freckles of a space age Mickey Rooney bearing witness to their new

sense of religion; a bundle of congressional sticks looking for any reason to display their movieola faces before a TV minicam; a current, mass appeal film (*War Games*) whipping the national interest in hacking into a fine froth; and TV news producers and directors ever aware to anything that can be sensationalized and be-

neath whose taste for pithy scripts the more primordial taste for silent-screen histrionics lurks on and on. Heck, even the antiseptic J. Edgar Hoover might have been tempted — after all, this was the film for which the folks in public relations spent thousands sacrificing reputations.

Or could this all have been the work of prime-time news sponsors who knew they had their own congressional pigeons to feed before another flock came home to roost? And what better source than one exploiting the possibilities for data base incursions to a nation grown edgy over privacy as electronic networks spread to touch the inmost corners of its manifold lives?

On the whole, I favor the political exploitation scenario over the sinister sponsor stratagem. Apparently wearied by the parade of wizened scientists sounding the trumpet over conceptual developments of no seeming practical importance, our pronouncedly unintellectual Congress hovered like a motionless school of fish in the depths of its own ignorance, allowing all the warnings of responsible security experts to float by, waiting for more attractive publicity bait. When it materialized in the form of a juicy young hacker/worm, their bit and swam with their prize to the nearest make-up studio to prepare for a televised fishbowl epiphany.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.



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## READER COMMENTARY

# MIS: Make Anticipating Corporate Needs

Do you approach corporate management with ideas on how management information systems (MIS) can help them run the business better, or do you wait for them to tell you what they want? The ability of companies to survive and prosper during the 1980s and 1990s will depend greatly on the

quality of the information they receive to run their businesses, the information that MIS is best suited to provide. If you are offering high-quality information that anticipates needs on a timely basis — often before corporate managers know they need or want it — your department is doing both it

self and the company a great service.

Many managers of companies still do not have a technical grasp, even on a modest level, of the functions of their MIS departments. This, in terms of obtaining better management information and knowledge of what should be done; whether it

can be done or when it could be done remains so elusive that the relationship of company management to its MIS function is hampered. This is where you can help. You can guide management in determining what kind of information they need by letting them know what you can provide, in how many differ-

ent forms and how much it will cost.

It cannot be guaranteed that one particular technique or methodology will work for you in making your MIS department more action-oriented. However, a number of factors can be identified that can foster anticipation of corporate needs, the most obvious being your own style of managing the MIS department. The director or vice-president of MIS usually sets the standard for how the department as a whole acts. The nature of this influence depends on personality, education, experience and industry knowledge.

These variables combined, plus others, have a great bearing not only on how you view problem-solving responsiveness, but also on how the entire department operates. If you tend to wait for direction from corporate management, it's likely that your people tend to wait for direction from you. If, on the other hand, you've set a style of forward-thinking creativity, you've given others in the department the message that this approach is acceptable and desirable for them as well.

Competence in industry applications and knowledge of your company's unique requirements within the industry are areas in which MIS staff education — including your own — should be strengthened. Your staff, like many others, may be composed of people who are technically competent, but who lack the depth of industry expertise and knowledge of the special requirements of your organization that would complement their technical skills.

## Responsive MIS

Providing the fertile ground for a responsive MIS function is the job of company senior management. Unless you were hired or promoted from within, you should seek a thorough introduction to the company and its problems, opportunities and special needs. As you hire staff, you should make sure that they receive a similar orientation.

Involvement in the mainstream of your company is critical to being able to act rather than react. It allows you to approach senior management with constructive suggestions, and it affords senior management the opportunity to see you and your department to advantage.

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but it can be done. One successful technique is to become involved in one of the operating committees of the company, if this is compatible with management style and company organization. As a function vital to the future success of the company, your department is likely to be a welcome addition to such a committee. If not, an alternative is to suggest that an MIS or "information needs" steering committee be established to guide and monitor the MIS process. Such a committee should bring together the most senior members of the management team and MIS management for discussion of MIS' relationship to the company as a whole, and it should meet regularly.

Both of these techniques can encourage cross-fertilization of ideas between MIS and corporate management, and they can give you great insight into the workings of your organization. To remain successful, however, either approach must be based on free give-and-take of ideas; the communication must not be one way.

## Become Involved

There are other ways to show senior management that your department acts rather than reacts. Becoming involved in industry-oriented DP panels or groups and reporting back to management on what you have learned can be a healthy stimulus. Meeting with your peers within the industry can be informative and rewarding. For example, if you can arrange to visit counterparts in similar but (ideally) noncompetitive companies, you can get valuable exposure to different perspectives on problem-solving techniques. Such experiences can help you to understand better how problems have been solved within your organization vs. how they might have been solved. You can act on this increased understanding by presenting senior management with alternative approaches to solving current problems.

These activities may not result in

an immediate change in the way you manage your department or in the way you are regarded by senior management. They can, however, contribute to preparing the fertile ground that will eventually yield greater understanding and allow you to be more responsive to and even anticipate corporate needs.

As you move toward becoming a more action-oriented department, the areas to which you should give the most concerted attention is planning. Planning is the glue for your department, allowing it to operate efficiently and effectively. A proper approach to planning will exert a


positive influence on every aspect of your performance.

MIS planning is not, however, your responsibility alone. Corporate needs and directions are usually identified by management above the level of MIS. In addition, most organizations follow a strategic plan developed by senior management that delineates objectives and identifies the resources required for its implementation. How well you comprehend and provide support for the overall plan is part of the ultimate measure of your responsiveness to company needs.

Planning requires involvement:

You must interact with users. You can do this by explaining how MIS works to solve user problems or to listen to users explain their problems and needs. On the more formal level, you can organize personnel meetings, structured presentations and written reports to bring your message to the rest of the company and to promote effective interaction between MIS and users.

An MIS function that wants active involvement gets the greatest benefit from a visible and lively user education program. Don't offer such a program just for the sake of appearances. (Continued on Page 58)



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# MIS: Anticipate Corporate Management's Needs

(Continued from Page 57), because this is a waste of everyone's time. Through an in-depth program, you can foster awareness, understanding and appreciation of the range of activities you offer the user community and, ultimately, enable users to take greater advantage of your department's services. The payoff should be a more

important and influential role for your department within the company.

Your department should also take a leading role in introducing new MIS technology to your company. The 1980s will be characterized by dynamic growth in the utilization of microcomputers and their integration into the traditional data process-

ing use environment.

Thus, effectively managing this new and powerful tool, integrating it successfully into the user environment and establishing data and management controls over its use will be the benchmark of your active involvement in company growth.

Technological change will require greater user involvement and more extensive user education programs, and the MIS department should lead the way in promoting these developments. How you implement this technology and assist the firm in benefiting from its capabilities will shape your department's future.

In dealing with senior management and end users alike, avoid technical jargon when at all possible. The extra effort to turn computer-ese into simple English will be repaid when users and management feel comfortable in discussing possibilities with you.

## Increase Productivity

A highly effective method of impressing upon senior management the value of your department is to increase the productivity of the MIS resources to yield better and more timely management information. With the portion of your department budget related to people growing at a faster pace than the budget for hardware, taking full advantage of your people resources will have the greatest positive effect on your department's bottom line. Greater productivity and efficiency will encourage management to accept expanded roles for MIS within the company structure.

One way to work toward productivity improvement is to introduce and make good use of packaged software. Packaged software reduces the lead time for implementing applications and can reduce the requirement for additional staff while improving the productivity of your existing staff.

With the dynamics of technological change, the increased DP savvy of the end user and the need for optimal productivity from your people, you can no longer allow a less-than-satisfactory interrelationship among MIS, senior management and end users to exist. By taking an active approach to improving the relationships, you can head off problems before they occur.

You must seek to solve problems without relying on traditional techniques that may result in delays and in lost opportunities as a result of the delays. Today, you

must manage your MIS function with an eye toward results. Work at identifying problems, understanding them and coming to grips with them in a technical

sense. But keep the emphasis on timely and efficient implementation.

Tharrington is a senior partner of Case and Co., Inc. in Stamford, Conn.

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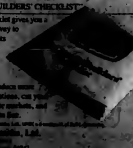
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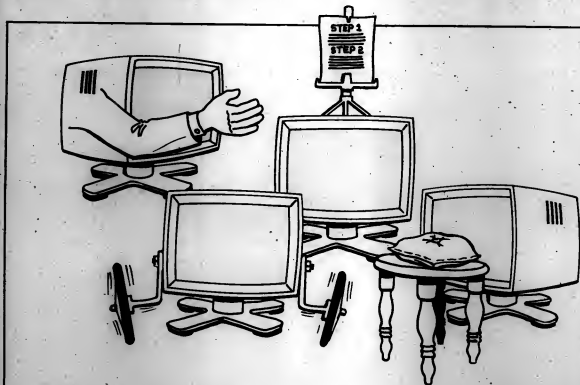
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## Friendly to all or none?

*User friendly, as a general term, is meaningless. If some naive definition was accepted based on what novices would like it to mean, the term would have meaning but be useless as a concept.*

## Designing for novice & expert

*If today's 'user-friendly' systems fail to meet the needs of both novice and experienced user, the fault lies in the method, not objective. The solution is good design technique.*

# User Friendly

By Paul F. Nesdore

As microcomputers and software application packages grow in complexity, more and more vendors claim their systems are user friendly.

What does "user friendly" mean? Is the concept of any value? Is it desirable? Could it be harmful? How do you tell if one program is more user friendly than the other?

Before the arrival of microcomputers and word processors, users of mainframes and minicomputers were almost exclusively professional programmers or

systems analysts. "User friendly," if the term had been defined then, would have been anything easier than IBM JCL.

However, with the use of computers by complete novices, the need for a simple system interface became clear.

When microcomputers and word processors were introduced, the problem was not severe, for functionality was limited and complexity of interaction was at a minimum. As the machines' versatility increased, however, so did the difficulty of inputting and accessing information. This situation caused a mild panic among both the untrained personnel who saw the computers suddenly appearing in

their offices and the vendors who realized their products might be perceived as too hostile to use. People who had no concept of an operating system now had to absorb some rudimentary facts about them and learn basic operating system commands in order to execute and manipulate their applications programs.

In order to overcome this creeping cyberphobia, vendors countered with an overwhelming campaign of user friendliness, hurling the phrase recklessly at customers. The marketing departments of these companies had a lot going for them with this attack. The user, after all,

*(Continued on In Depth 4)*

By William G. Quirk

While today's so-called "user-friendly" systems may rightfully be described as "novice friendly," they frequently fail to be "expert friendly." Yet, contrary to common opinion, there is no inherent conflict between aiding the beginner and pleasing the more experienced user. Poor design techniques only make it appear that way. It is perfectly possible to design interactive application systems that meet and even surpass the quality expectations of novice, intermediate and expert users.

Novice-friendly systems initially present the beginner with a minimal subset of user interface capabilities. These functions typically allow the novice to accomplish the basic work objectives of the application, but rarely in the most efficient possible way. Limited functionality, learner aids and special protective features all negatively affect novice productivity. But this lack is of little concern to the beginner. He is preoccupied with acquiring basic system familiarity.

On the other hand, once he is basically familiar with the system, the user becomes increasingly interested in more efficient ways to accomplish his applica-

tion-related work. Expert-friendly design supports this shift in the user's priorities by teaching him how to bypass eventually the novice-level support features that now hinder his efficiency. In addition, expert-friendly systems provide the experienced user with a rich assortment of personal productivity enhancement tools. Transparent to the novice, these tools improve user efficiency by exploiting functional and data repetition inherent in the application.

Although menu screens serve as important memory aids for novice users, they often impede the experienced user. *(Continued on In Depth 7)*

## DEPTH

(Continued from In Depth/3)

wanted to believe that the system he was buying was friendly. And the marketers certainly stood on sure ground. Since no good definition of user-friendliness existed, who could say whether the system was or wasn't?

User friendly, as a general term, is meaningless. If some naive definition were accepted based on what novices would like it to mean, the term would have meaning but be useless as a concept. More precise definitions could only be restricted to relative definitions. That is, a software package A is more user friendly than software package B running the same application under the same operating system. Further, user friendly, if defined in a more general way, tends to contradict the technology.

Do we have user-friendly computers now? There are menu-driven applications packages for simple programs that allow a beginner to have an application running in 15 minutes. But if a more complicated package is considered (a decision support system, for example, or a computer-aided design and manufacturing application), the training time could be considerably longer. Is it fair, then, to say that the former is user friendly and the latter not? This test is obviously useless and does not help at all in formulating a definition.

If the use of applications packages is more closely scrutinized, two different aspects come to light. One is the initial time it takes to have the package up and running the basic application; the second is the ease of adding options and permissible variations. The more sophisticated programs have a variety of parameter modifications that the user can manipulate in order to apply the package to a particular form of the problem. The ease with which the user can perform these functions is a direct indication of the package's user friendliness.

Vendors or users frequently refer to the user friendliness of a software package without considering the instruction manual or training aids. User friendliness must be viewed from both angles. It would be possible to have a user-friendly operator's manual or program documentation, but a very unfriendly program in terms of using all its features once it is up and running. Similarly, an interactive tutorial program could be very user friendly and, again, the program not so easy to use.

A frequent complaint is that the manuals are incomprehensible, but once the program is understood, it is fairly friendly. No vendor should make this oversight. Investment of time in producing a clear, understandable manual should be an absolute requirement.

Another neglected area regarding user friendliness is the operating system. It is one thing to say that an application program is user friendly and another to say that the program

***It would be possible to have a user-friendly operator's manual or program documentation, but a very unfriendly program in terms of using all its features once it is up and running. Or a tutorial program could be user friendly and the program not so easy to use.***

must be run on a particular micro or on a particular operating system with no comment on the friendliness of

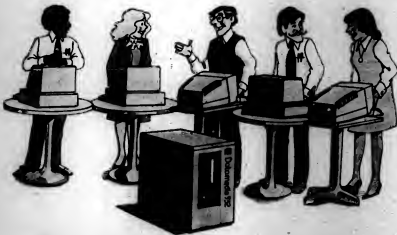
the operating system. The user must first confront the operating system before he gets to the application. But

how much vendor advertising or software development effort has been given to user-friendly operating systems?

The situation with office automation is no better. There was a great amount of time spent at Syntopticon this year on the subject of training. A backlash was feared because training was not being done, and some expressed the fear that thousands of dollars of computer equipment would not be utilized because no one



## Personal computing.



## Departmental computing.

## IN DEPTH

had been taught to use it ["Upgrade In-House Training," CW, June 20]. The implication and, indeed, the indictment is against the vendors of the hardware and software.

Even without a definition of user friendliness, it is tempting to ask why user-friendly equipment should have such a formidable training requirement that already-purchased equipment would lie idle because no one knew how to operate it. It is difficult to believe that when this

***Because of its "rollability," the mouse has the aura of a gimmick, a stigma not attached to the keyboard. Did anyone consult a psychologist before marketing this device?***

equipment was sold, the vendor clearly expressed the training requirements.

What if the software or hardware was truly user friendly? What would it mean to you as a user? The popular

view is that a user-friendly program would allow complex programs to be run with a minimum of manual reading, training and keystrokes. Now we can get back to a statement made earlier regarding the concept of user friendliness: as contradicting the technology.

To declare that a complex program can be run with just a few keystrokes implies that you are truly running a canned program. Any complex function must have numerous parameters specified. If these parameters are not specified, then a default setting must be made for each one. The conclusion is that the more user friendly a complex program is, the less control the user has over its internal specifications — that is, unless the expertise of the user is elevated. But now another dimension has been added to the possible definition of user friendliness, namely, the expertise of the user.

Before attempting to define "user friendly," consider some of the other nonsoftware approaches. The mechanical interface to the computer lends itself to promoting user friendliness as does the design of the software. Innovations in this area include the mouse, the touch screen and voice input.

The mouse is a valiant attempt to eliminate keyboard fright. The mouse has two main advantages: it eliminates keyboard use and provides more cursor control freedom. But the major question remains: Does the mouse make the computer more accessible, more friendly, to certain target audiences such as executives? The answer is no. An executive who does not type and who regards the keyboard as a secretary's tool will now be rolling around on his desk something akin to a mobile joystick with buttons. If the vendors add more buttons to the mouse, it will become a mobile keyboard without cursor keys.

There is no possibility that this device will feel more comfortable to the executive than the keyboard. Because of its "rollability," the mouse has an aura of a gimmick, a stigma not attached to the keyboard. Did anyone consult a psychologist before marketing this device?

As for the touch screen, the intimidation is even greater. If touching a keyboard is intimidating, the anxiety level must certainly be raised to touch the screen itself, a screen that emits radiation. This feature obviously will not be the sought-after breakthrough in user friendliness.

There have been great hopes for voice input to provide user friendliness through direct interaction between the spoken word and computer. But as a colleague of mine pointed out, dictation equipment — an obvious, low-cost way to increase productivity dramatically — never realized its full potential because people were too intimidated to talk into the device. What makes the voice input advocates believe that talking into an

A person can perform wonders with a personal computer. But with two or more people using it, the computer becomes the instrument of a tug-of-war, creating bigger business problems than the ones it was expected to solve. Add more personal computers — even network them — and the costs and the problems continue to grow.

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## FRIENDLY TO ALL?

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### IN DEPTH

even more sophisticated piece of equipment, such as a computer, will be easier?

The mistake is made in assuming that the user would rather act in a more human (social) manner than in a

more mechanical way. The state of human communication has always been less than adequate.

Communication must be made as impersonal as possible to relieve cyberphobia,

not the opposite.

With all these problems in mind, consider the following definition: A system is user friendly if it permits execution of the function for which it was designed in a

minimum of training time by a user who has little knowledge of the process and in a moderate amount of time in its most sophisticated form with options and extensions by a user with a sound

knowledge of the intricacies of the system.

The actual useful information from such a definition would be relative — that is, how much more time one program took than another. The difference between a canned program that is user friendly and an "uncanned" program that is easy to use is the difference between the software vendor saying, "This is what we are going to do for you" and, "What would you like this program to do for you (of course, within the area of its application)?"

You cannot have user-friendly input to a complex application and expect that the program will do everything you want.

If, however, you have complete control of all the bells and whistles, the program will no longer be user friendly, unless you are such an expert in the field that it is easy for you to set all parameters and options. Further, gimmicks (such as the mouse) that seem to be designed for user friendliness do not seem promising.

Probably the one single area that can be improved easily is for the vendors of software packages to put much more time in writing clear instruction manuals and documentation, including teaching aids and interactive tutorials. Their failings in this area are the reason for the recent successes of the computer schools teaching Mr. Average how to get past IBM DOS.

Much has been written about fifth-generation computers, knowledge-based systems, inferences per second and the like. The concepts involved in fifth-generation computers are drastically different from the von Neumann-type approach that threatened the vast array of languages and thinking about computers today. The attempts at user-friendly systems are productive in this regard — not as a bridge to the fifth generation, since the fifth generation cannot be arrived at by this means — but as a stop-gap measure to increase productivity as much as possible until the fifth generation gets here.

#### About the Author

Paul F. Nesdore is group managing editor, international publications, for Datapac Research Corp. in Delran, N.J.

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(Continued from In Depth/3)

Expert-friendly systems allow menu bypass. They also teach bypass methods as a by-product of menu usage.

Menu bypass is taught through information on the menu and subsequent response screen. For example, a menu of major purchasing system functions may identify purchase order entry as POE, vendor file maintenance as VFM and so forth. If the user wishes to select the purchase order entry function, the menu information instructs him to enter the mnemonic POE in the SELECT field and then press ENTER. The response will present the purchase order entry screen, and it will also inform the user that SELECT POE is a valid system command that can be entered without using the intermediate menu screen.

Some will argue that it is more efficient to identify menu functions by function key or numeric identifiers. But these commonly used techniques fail to support menu bypass. Also, the keying efficiency defect of the mnemonic identifier approach is only visible at the novice level, and the novice will not perceive any deficiency.

Prompt screens also serve as memory aids for the novice user. They remind him of information needed by the system in order for it to take some user-desired action.

For example, while viewing the purchase order entry screen, the user may need validation information for the ACCOUNT field. If the system is novice friendly, it will allow him to display a user interface documentation prompt screen (help-prompt). The information on the help-prompt explains how to access the desired documentation.

Expert-friendly systems allow prompt bypass and teach bypass methods as a by-product of prompt usage. Similar to menu bypass, prompt bypass is supported by command language and taught by information on the prompt and subsequent response screen.

For the help-prompt example, the prompt information may instruct the user to enter the values ACCOUNT and EDITS in specified help-prompt screen fields. The response screen will then display the desired validation documentation together with an

**Logical user files offer another powerful vehicle for implementing novice/expert flexibility. They allow each user to tailor the system to his own experience level. Novice-level support can be gradually turned off and expert-level productivity aids turned on.**

explanation of documentation direct access. For this example, the user may learn that he could have by-

passed the help-prompt if he had originally entered the command HELP ACCOUNT EDITS, rather than

calling for the help-prompt.

Although expert-friendly systems allow experienced users to bypass menus and prompts, they automatically reappear if the user slips back into novice-level behavior. If the user enters a nonspecific selection request, he is presented with a menu. If he fails to supply the system with needed information, he will be prompted for the information.

Unfortunately, it is not always possible to reinvoke novice-level

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support automatically as a function of the user need. If, for example, an experienced user decides he is tired of a particular system warning, an expert-friendly system will allow him to suppress this irritant, but then he is on his own. The user cannot expect the system to discover the times that he still needs the warning.

Menu, prompt and warning bypass all require command language power. As the user gains system experience, he learns more and more about the user interface flexibility supported by the language.

Logical user files offer another powerful vehicle for implementing novice and expert flexibility. They allow each user to tailor the system to his own experience level. Warnings and other novice-level support can be gradually turned off, and expert-level productivity aids can be gradually turned on.

There are three basic user interface design strategies for maximizing user productivity:

1. Minimize user interface time factors for each request/response dialogue component.
2. Minimize the number of request/response pairs needed to accomplish a given amount of work.
3. Maximize user input data integrity.

The first two strategies improve user productivity by reducing the time required to accomplish a fixed amount of application work. That is, they focus on techniques that get the job done more quickly. The third strategy recognizes that the reliability and quality of information are directly related to the productivity of all those who are affected by system outputs.

The first strategy is implemented by techniques that reduce one or more of the following:

1. Response comprehension time.
2. Input preparation time.
3. Cursor movement time.
4. Information keying time.

Some design features serve this end by recognizing and satisfying basic human needs. Another category of techniques reduces user interface time factors by exploiting functional and data repetition inherent in the application. Generally speaking, techniques in this second category require the expertise of the experienced user, while those in the first do not.

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Techniques that help to reduce user interface time for any user include:

1. Screens organized for eye movement and cursor movement efficiency.

2. Utilization of terminal and teleprocessing monitor features that speed cursor movement.

3. Consistent identification and location of information that appears on multiple screens.

4. Needed reference information supplied on the response input screen.

5. System response messages that are precise and standardized with respect to vocabulary and structure.

Experienced users may take advantage of application repetition to reduce user interface time factors through:

1. Screen initialization techniques that allow reuse of input values from the preceding input screen.

2. Screen initialization techniques that allow the user to save or retrieve frequently used input values on or from supporting logical files.

3. Internal completion techniques that supply missing request information by exploiting a logical key relationship with information entered by the user.

4. Internal completion techniques that allow the entry of abbreviated values with subsequent internal expansion.

5. Internal completion techniques that supply missing request information by duplicating other values entered by the user.

6. Work sequence and selection control features that support maximal back-to-back request repetition.

7. Dialogue-level control techniques that minimize the need for request-level user instructions.

Experienced users may also exploit application repetition to reduce the number of dialogue request/response pairs. Techniques that eliminate unproductive pain and/or improve the work contribution of productive pairs include:

1. Menu, prompt and warning by pass.

2. Techniques that allow bypass of the "see it one more time" successful response in order to prepare the screen for new work.

3. Methods that combine error correction with new work.

4. Compact entry and/or

reference formats based on common/exception analysis.

5. Mass change, copy and other powerful information update commands.

6. Information retrieval and summarization features.

Finally, techniques for maximizing input data integrity include:

1. Screen initialization, internal completion and other methods that reduce direct keying of input.

2. Screen field relationship edits.

3. Personalized file-driven validation.

4. Rollback/undo features.

If minimal functionality is

to be preserved for novice users, productivity aids must be available as user interface options. The beginner should not be required to use the aid in order to get his work done. But as the novice

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## IN DEPTH

gains system experience and becomes increasingly involved in work efficiency, he should learn how to activate the productivity enhancement features.

Each of the following ex-

amples illustrates an efficiency aid together with an activation method. In each instance, note that the user does not need the aid to accomplish his application-related work. However, if he

activates the aid, he can accomplish his work more quickly.

1. For an order entry application, the entry clerk notices that he has several or-

ders with the same accounting and shipping information. The system allows him to interrupt the order entry dialogue, "check off" the accounting and shipping fields, enter a command

to set the redisplay rules and continue with the order entry dialogue, with the system now redisplaying shipping and accounting data from the prior order to initialize the screen for the next order.

2. An employee information maintenance system allows the update of one employee's information to be combined with identification of the next employee whose data requires update. If error correction is not required and the next employee has been identified, the response displays information for that employee.

3. Since health care claims often list several services with the same diagnosis and/or service date, the claim data entry screen contains default fields for this information. If the data entry clerk enters default diagnosis and service data values, he may then omit identical values at the individual service level. The system will internally complete the service level information by duplicating the corresponding default field value.

4. A process control information system reports inspection information that is repetitive with respect to product line equipment and equipment operators. Considering this data repetition, the user is allowed to maintain tables of valid equipment IDs by product line and valid operator IDs for each equipment ID. These tables are then used for validation of input inspection information. In addition, if there is only one valid operator for a given equipment ID, the system can internally complete the operator information.

Interactive systems can help the beginner gain basic system familiarity, support and teach novice-users to bypass and satisfy the "power" needs of experienced users without negatively affecting the beginner. If today's so-called user-friendly systems have failed to accomplish this end, the fault lies in method, not objective. The problem is not one of design trade-offs. The solution is good design technique.

#### About the Author

William Quirk is a systems design consultant who lives in Guilford, Conn. This article is based on information in his interactive systems design seminar, a two-day course available through William G. Quirk Seminars, 1500 One Corporate Center, Hartford, Conn. 06103.

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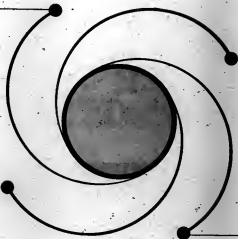
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- **Package Software**
- **Data Base Management Systems**
- **Fourth-Generation Languages**
- **Structured Systems Methodologies**

## Four Tools to Build Systems Synergy

By Mike Ruggera

*Four technologies which evolved in the 1970s typically are offered as separate, total solutions to data processing problems. But package software, DBMS, nonprocedural languages and structured methodologies are more effectively used together, combining the strengths of each to minimize their individual weaknesses.*

Companies assign their data processing managers to take charge of two divergent missions: to support high-volume production systems as well as tactical and strategic business planning.

It is not unusual for a production system to spend two to three years in development and then be used by the business for the following 10 to 15 years.

Tactical and strategic systems, on the other hand, are characterized by short lead times and short life spans. A manager may request an analysis in the afternoon and expect the results on his desk the next morning. After reviewing the result, he often tosses it out and requests a totally different analysis. The functional manager can ask for any data from any source at any time. This unpredictability can be particularly unnerving to the DP professional unprepared to cope with it. However, this unpredictability is a critical part of tactical and strategic analysis; the DP professional must learn to handle it.

During the last decade, a number of technologies emerged to help companies develop a "total solution" to their information systems problems, encompassing the production area, as well as strategic and tactical planning.

Package software, data base management systems (DBMS), fourth-generation languages and structured systems design and development are unquestionably major accomplishments in the effort to deliver information systems to modern businesses. However, proponents often mislead users in presenting these aids individually as complete solutions to the information system problem.

The first step in building a truly "synergistic" systems environment is to recognize those four technologies as tools to achieving the business' system objectives. Each tool must be used in a framework that maximizes its advantages while minimizing disadvantages.

The second step toward a synergistic environment requires that the data in the business be viewed relationally. This statement does not mean the data must be contained in a relational data base. Business data has always

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been inherently relational. People just never looked at their data this way because the effort required to perform the relational operations in procedural languages far exceeds the value of the resulting information. Fourth-generation languages change the situation completely.

Any data file can be viewed as a table of rows and columns. The rows are records of the file, and the columns are the individual data elements. This concept can be applied to any file in a business regardless of whether it is physically organized as a sequential file, an indexed file or in a data base. It also applies equally well to tape files, disk files or any other physical medium.

In practice, the concept is very difficult to apply using third-generation languages like Cobol because one gets so completely immersed in the details of the access method. Using fourth-generation languages, defining a file simply requires writing a set of statements and usually takes an hour or two. In using the file definition, one is oblivious to the file's physical structure. Columns of the table can be isolated as is done in producing a report. Data elements from the file are se-

BUDGET		ACTUALS	
Acct	Budget	Acct	Y-T-D
100	3879	100	5000
200	574	205	900
300	1395	300	2500
306	563	306	750
400	1278	400	2000

PROJECT		PROJECT <> ACCOUNT	
Pjkt	Y-T-D	Pjkt	Acct
704	276	704	205
709	97	710	205
710	143	709	400
713	258	724	400
724	34	710	100

Figure 1. Example of Fragmented Data Files

lected to appear. This selection can be done easily in procedural languages and in a fourth-generation language.

Rows of the tables can be selected using any criteria. This procedure is also typically done in reporting as records from the file are chosen to be included in a report. It can also be easily done in Cobol and in a fourth-generation language.

These tables can be logically matched with each other by using a

column in each table that contains the same data element. In this way, data that is logically related but stored in different physical files can be brought together for reporting and analysis. This kind of file matching is very complicated in procedural languages because of all the details of the matching logic. It is trivial to perform in a fourth-generation language.

For any two tables that do not logically match because related data ele-

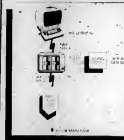
ments are not the same data element, a third table can be constructed that will define how to relate the other two tables. If one is presented with two files that cannot be matched directly because they do not contain the same data element and if they contain related data elements, a file can be created that specifies how to match records of the two data files.

This type of matching is hardly ever performed in Cobol because it requires writing programs to create and maintain the intermediate file and programs to perform the two matchings. In a fourth-generation language, the intermediate file can be created and the maintenance routines written in about a half day. Then the routines to perform the two matchings can be written in an hour or two.

Figure 1 contains a subset of the data files in a typical company. Note the fragmentation of the data into separate files. Each file was probably created by a separate system built some 10 to 15 years ago. Note that both files (budget and actuals) contain the same data element, account number. Creating a report of budget and actual data in a fourth-generation

(Continued on In Depth/18)

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## SYSTEMS SYNERGY

### IN DEPTH

In Depth/16

## Surveying Four Technologies

Achieving a synergistic system architecture requires an understanding of each technology's pros and cons. Here is a brief rundown:

**Package software.** The biggest advantage is its low cost. Most packages are available in the range of \$60,000 to \$100,000. A comparable system developed in-house could cost from \$350,000 to \$500,000.

**Another important advantage of package software is that good documentation and training is professionally provided.**

Software vendors are responsive to the impact of regulatory change to system logic. Typically, if a new regulation is enacted, resources have to be removed from a current project to revise old software to comply. With package software, the vendor makes the modification and ships it to current users at little or no charge.

Also, this kind of software is especially advantageous for multidivisional corporations. They set the standard for the particular application, eliminating the expense of multiple development efforts. Also, it may be necessary to have only one support group serving all the divisions. Both these points can result in substantial savings and provide continuity in a field experiencing a great deal of personnel turnover.

The final advantage is that the software will constantly be upgraded by the vendor. As information system technology changes, the vendor will change the software to take advantage of the new capabilities. No longer will the software go out of date.

Probably the biggest disadvantage of package software is that the package will not do everything the way the company would like. In all cases,

some changes will have to be made to fit the practices of the business to the package. However, one objective of installing a new system may be the elimination of current inefficient practices, which packages encourage.

Another disadvantage of package software is that the company is beholden to the vendor to upgrade, fix or modify the software. More often than not, the priorities of the vendor are different from your priorities. Similarly, one is forced to upgrade the software when the vendor issues a new release irrespective of whether one wants to use the new features of the new release. In fact, if the software is not kept up to date, the vendor will refuse to support it.

Finally, package software, like traditional systems, is built to stand on its own and therefore does not integrate well with other systems. If one buys multiple systems from the same vendor, there is some assurance that these systems will transfer required data from one system to another. But at no time does the vendor assert that its software will integrate with any of the user's systems.

**Data base management systems (DBMS).** The major advantage of the data base concept is the physical separation of data from programs. Close behind this advantage is the ability to integrate all the data of all the systems of the business. Of less importance is the ability to manage the company's data as a data resource and the ability of the DBMS to handle high transaction volumes at good speeds.

But there is also a catastrophic disadvantage to using a DBMS. To achieve the full benefits of organizing one's data under such a system, it is necessary to build all the systems

of the business using the DBMS. The result is often referred to as a total information system. A large number of companies have tried for this goal and failed miserably.

If you are talking about rebuilding all of your information systems, you are undertaking a project of colossal proportions. To be specific, a total data base project is usually projected to take hundreds of man-years and cost tens of millions of dollars. It may require five to eight years to complete. During the initial two to three years, the subsystems and data requirements are being analyzed. No programming is being performed, and therefore no subsystems are completed. The fortunes of the business can change or there can be a change of management and the data base project is interpreted as producing no results and is summarily terminated.

Even if total data base projects were not terminated for managerial reasons, they contain a philosophical contradiction. A total data base project

takes years to complete. Meanwhile, businesses change over time, and with change their information needs change. As a result, the business the subsystems were designed to handle will not be the business at the time the project is completed. In many instances, the divergence will be so great that the completed systems would be useless. The data base project team would have to start designing a new set of subsystems.

**Fourth-generation languages.** Fourth-generation languages are software that permits the system designer and programmer to concentrate on the business problem rather than the structure of the data or the details of programming logic. In using a fourth-generation language, one thinks in terms of what one wants the program to do instead of how the program is to perform the "what."

The major advantage of fourth-generation languages results from the dramatic reductions in program development effort. For example, a sys-

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## Where Strengths Counteract Weaknesses

tem that might take eight to 12 months to design and program in Cobol can be expected to take 1½ to two months in a fourth-generation language. This ability to generate systems quickly makes these languages highly attractive for tactical and strategic analysis. By definition, the need for these types of systems arises and dissipates very quickly. If they were to be developed using traditional programming tools, by the time the software was completed, the system would no longer be needed.

Fourth-generation languages are relatively easy to learn and use. The average learning curve of a traditional programming language like Cobol is two years, while the average learning curve of these languages is two months. As a result of this short learning period, it becomes practical to teach user managers and their subordinates to use these languages to

solve their own problems.

Similar to DBMS, fourth-generation languages have the advantage of separating the data from the programs. This trait makes it possible to add new data elements or reorganize the data without having to rewrite the programs that use or update it. The ability to access data from any file may be the most powerful of the software's strengths. Most of the project backlog in data processing shops comes from requests to obtain reports from existing files. This work is not done because each report would require three to five days of a Cobol programmer's time and the priorities have been set to work on large projects only. Using a fourth-generation language, this type of report can be completed in half a day.

Along with the ability to access any file in a data processing shop, these languages provide the ability

to match data from these files. A typical user request these days is for a report that requires data from two or three different files. Using traditional programming tools, such a report would require two to three weeks to complete. Using the file matching capabilities of this language, such a report can be generated in a day.

The major disadvantage of fourth-generation languages is that with all the available flexibility and all the promotion about how easy they are to use, they can fall victim to very serious abuse. The first area for abuse comes from letting inexperienced users design their own systems. Invariably, they will take a wrong course and find themselves with an unmanageable result or a result that costs much more than it should to run.

The second area of abuse comes from the idea that once users have had basic training in these languages, data processing can forget about supporting them. Nothing could be further from the truth. Data processing and the users must come to some agreement as to what level of complexity the user may undertake before data processing will get involved.

The second disadvantage of fourth-generation languages is that they are poor at processing volumes greater than about 15,000 records. A number of people have seen these languages' all-round utility and fast system development capability as a signal to program every system in the shop in the language. The results are invariably disastrous. These languages are generalized software designed to handle a large number of request variations for a fair-size data base. To handle very large data bases, one has to accept the fact that customized application-oriented software will be required.

Structured systems design and

development. The major advantage of this approach to software development is that the user is involved throughout the entire process. His participation ensures that his desires will be met and that there will be an understanding of what the system's capabilities are.

The next advantage is that this methodology affords great control over the software development process. Every step has certain outputs expected and the step is not considered completed unless the outputs have been presented and approved by the user and peers in the systems and programming group. And if someone should leave the staff, the project will not be substantially delayed. The new person can review the documentation of the previous steps and continue the project.

Finally, by following the methodology, one is assured of achieving a high-quality software product. This result will pay repeated benefits as it becomes necessary to maintain and enhance the software over its lifetime.

The major disadvantage of structured system development is that one is still developing systems from scratch. All the high costs associated with this kind of effort will be experienced. Also, there is a heavy time commitment required by the user. In many projects, the user must assign people full time to participate in the development effort.

The methodology has to be performed by trained, experienced people. Valuable staff members may have to be taken away from other projects and a good deal of money spent on training. Even with all the training, there is no assurance that the people will understand and adopt the concepts involved.

Finally, since the system will be built in-house, it will have to be maintained in-house.

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100	Gemma	792	Jack	1885	2065	3750
100	Gemma	721	Alan	638	754	1392
400	Zuku	792	Fred	2682	2384	5046
400	Zuku	834	John	385	571	745

Figure 2. Traditional Flat File

(Continued from In Depth/15)  
tion language would simply require writing the file definitions of the two files and the routines to create the report. This job can probably be accomplished in a day, but certainly would not take more than two days.

Another file in the DP set contains project data. This file contains the data element, project number, which is related to but not the same as account number. Reports using this file with the budget file and/or the actual file can be created by defining the relationship between project numbers and account numbers in another file. This file can be created in the fourth-generation language data base and maintained using the maintenance language. The resulting files can be matched and the desired reports created. A project like this could take two to four days to accomplish using a fourth-generation language.

**Fourth normal form.** Using the relational approach to data files and fourth-generation languages to manipulate data provides the ability to access any data in any logically related way. An approach is required to direct the file designer to the files that should be created and maintained. That approach is formalization.

**Fourth normal form,** which describes the result of this process, is the state of data when the repetitions

have been removed in the three steps described below. There is a first normal form, which is trivial and consists of a straight listing of the data elements in the data base.

The first step of refinement checks that all nonkey data elements are dependent on the primary key. Any data elements not properly dependent are moved to new record segments, and the result is second normal form. Any system that has the same header information repeated for every detail record is not in second normal form. As a consequence of this file design, when any header information is changed, it has to be changed in every record. As a result of programming errors or data errors, the change is often not made, and the result appears as annoying reporting anomalies. Many systems have header records and detail records as a step to attacking this problem.

The second step is to ensure that all nonkey data elements are nontransitively dependent on the new primary keys. Any data element that is dependent on a data element that is not the primary key is moved to new record segments, and the result is third normal form. Data elements like account titles, department names and code descriptions should be in separate files. If the title or description is repeated on every record where the code appears and the title

PROJECTS		DEPTS	
Nbr	Title	Nbr	Mgr
100	Gemma	809	Harry
400	Zuku	792	George
		721	Alan
		834	John

EXPENDITURES			
Pjti	Dept	Q1	Q2
100	609	964	854
100	792	1885	2065
100	721	638	754
400	792	2682	2384
400	834	385	571

Figure 3. Same data as Figure 2 in Fourth Normal Form

is changed, it has to be changed on every record. Also, when a new entry is made, the title must be the same as previous entries. In either case, reporting and selection problems will creep into the files.

The third step is to check that multivalued dependencies are not also functional dependencies. Any data element that satisfies this test should be moved to separate record segments. The result is called fourth normal form. Many files contain rec-

ords with data elements that are direct functions of other data elements in the record. These can be tabular functions where the price or packaging is put in the record with a product code or values are added and the sum is in the record. In any of these cases, if the function key or argument is changed but the result is not, reporting and selection anomalies will result. The only way to avoid these problems is to keep functional data dependencies in separate tables

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## IN DEPTH

and calculate the function only when it is needed.

Figure 2 (on In Depth/18) shows a traditional flat file. Note that the project number and project name constitute a repeating group, the descriptors for project number and department number are included, and the sum of the first and second quarters' expenditures is included as the year's expenditures. This file also demonstrates all the anomalies mentioned. There are two different titles for Project 100. Department 792 has two different managers. And the yearly expenditures of Project 400, Department 834, is not the correct sum of the two quarters' expenditures.

Figure 3 shows the same file in fourth normal form. The project repeating group has been separated out; the department managers have been moved to a separate file; and the yearly expenditures have been dropped.

The traditional flat file can be logically created at any time by matching the appropriate data elements without concern that data anomalies exist. If a data error exists, it will be blatantly obvious because it occurs in every instance, and correction in one place will correct all the reports.

A classic diagram of the position various information systems take in business would show operational systems as the base for the total system environment. The tactical systems build on the operational systems' data, and the strategic systems build on the tactical systems' data.

Each of these layers of systems serves a different level of management. The operational systems serve the operating managers. The tactical systems serve middle

management in shaping policies and procedures. The strategic systems serve top management in setting a long-range course for the business.

The bottom layer for any

information systems environment is the business. If any system is not supporting the business in some way, it should be eliminated.

The second layer of the environment is the opera-

tional systems. These systems exist to support daily business functions. Package software will be a primary component of our operational systems. It is inexpensive, well documented, main-

tained and enhanced by the vendor and can be installed and put to use quickly with little risk of failure.

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## IN DEPTH

general ledger, accounts receivable, accounts payable, purchase order control, fixed assets, material requirements planning, production control, inventory control, payroll, human resource and

benefits management, work-in-process and many others.

In any business, there will always be some systems that are peculiar to that particular business or for which performance is a critical factor. An

example of the former would be the "back-room" accounting of a brokerage house or the policy information system in an insurance company. An example of the latter would be a decentralized or-

der entry system for automobile parts or an airline reservation system. For these systems, no package software is available and will probably never be available. In these cases, the business has

no choice but to build its own system from scratch and accept the costs of doing so.

There are, however, several choices in building systems from scratch. The first consideration should be the use of a fourth-generation language, which affords drastic reductions in development time and provides inherent flexibility. Regrettably, there will be many systems for which the transaction volume will be too great or the speed too slow to be programmed in a fourth-generation language. For these systems, application generators should be considered for parts of the system if not for the whole. Only as a last resort should procedural languages be used in the system development process.

On the other hand, use of a DBMS should be strongly considered in order to achieve the benefits of separating the programs from the data and to provide for the possibility of future systems using some part of the data base of the current system. Most of the application generators provide convenient interfaces to the popular DBMS.

With a good base of operational systems, the tactical and strategic systems can be tackled. The purpose of these systems is to permit intermediate and long-range planning. The first step is to provide access to every file in the DP shop. If this access is provided with the file definition capabilities of a fourth-generation language, the relational approach can be applied to the data. In this way, reports can be prepared from any file. Data that has been scattered into separate files can be brought together. If two files are logically related but do not contain the same data element, another file can be created to contain records that tell how the other files should be connected.

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## IN DEPTH

*Users will invariably want to access files that have not yet been defined or will try to generate a report that is beyond their experience. For these reasons, a support group should be established.*

every file in the data processing shop, the final step is to train staff members to use the windows and to support their use of the windows. The first item requires sending user personnel to the basic training sessions provided by the fourth-generation language vendors or providing the same training in-house. After basic training, it is necessary to provide some in-house training about available data and to emphasize the ability to join data in different files. This last point is usually underplayed in most vendor training.

Figure 4 shows a user terminal connected to the files of a sample data processing environment. The business has purchased a general ledger, sales analysis, inventory control and production control system for its operations. It has decided to build four of its information systems from scratch, one by using a fourth-generation language, two with an application generator and the last with a procedural language.

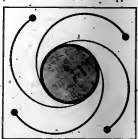
All these systems were analyzed, designed, programmed and implemented using structured system design and development. The structured approach allowed for project control and ensured that the users' needs were being met. As a product of the methodology, the appropriate documentation would be written and serve to support the system throughout its life.

A fourth-generation language file definition was constructed for every file in the business. It made no difference whether the file was from package software or from a home-grown system. After the definitions were created, it was realized that some of the files did not match because of different but related data elements. Table files were then created to match these files.

It has been recognized that users will invariably want to access files that have not yet been defined or will try to generate a report that is

beyond their experience. For these reasons, a support group should be established.

When a user wants to access a file that has not been defined, this support group develops the file definition. When users attempt reports beyond their abilities, the support



group provides assistance in developing it.

Implementing the synergistic systems environment. Since most businesses already have systems in place, what they need is some reasonable way to move from their current environment to the environment proposed above.

Any data processing shop can start at the level of defining the currently existing files to a fourth-generation language. This beginning immediately makes it possible to produce many reports that users have been requesting for some time. A program of user training and user support provided on a continuing basis would soon have to follow.

It should be noted that it is not necessary to define all files in the beginning. In fact, one could let the reporting demands direct which files need to be defined. Since file definition takes such a short time, it can be done just when it is required.

With the pressure relieved from the demands for tactical, strategic

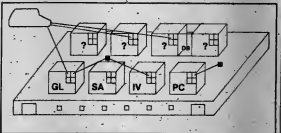


Figure 4. Synergistic Systems Environment

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information, the shop can turn its attention to upgrading the operational systems that can be replaced by package software. No concern should be given to how the package will affect fourth-generation language file definitions of existing files. When the new package is in place, the file definitions will be redone using the same field names to refer to the same data elements as much as possible.

This point is where the independence of fourth-generation lan-

**Users will invariably want to access files that have not yet been defined or will try to generate a report that is beyond their experience. For these reasons, a support group should be established.**

guages between the file and the programs becomes invaluable. As a result, 70% to 90% of the fourth-generation language code used to pro-

duce reports under the old files should be immediately usable under the new files. Of course, some code will have to be adjusted to the new

processing environment, but if this architecture is followed, that work will be kept to a minimum.

With as many systems as possible converted to package software, attention should be turned to rewriting the remaining systems. Again, in these efforts, every attempt should be made to use fourth-generation languages where performance is not critical or high volumes are not expected.

Where fourth-generation languages are not appropriate, the system should be built with an application generator and data bases for maximum speed and flexibility.

In either case, a structured systems design and development methodology should be used to manage the project and keep the users fully involved. The analysis and design phases must be performed no matter what development tool is used. Structured systems design and development give adequate opportunities for deciding if fourth-generation languages or application generators are more appropriate for the development phase.

The result of this entire effort should be a very strong set of production systems, obtained at a reasonable price and installed over a short period of time. An added benefit is that maintenance and enhancement are largely performed by the software and, therefore, maintenance expenditures can be kept to a minimum. Through the use of fourth-generation languages and the relational approach, users will gain easy access to data for tactical and strategic analyses. This benefit alone may be priceless.

#### About the Author

Mike Ruggera is a consultant based in Ford, N.J., who helps organizations achieve information systems objectives through the "synergistic systems environment."

He specializes in matching advanced software to an application.

Ruggera has worked in data processing since 1970 for companies such as RCA Corp., Chemical Bank and Engelhard Corp.

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# SPECIAL REPORT

## ***DBMS: Weighing The Options***



***Edited by Paul Gillin***

**October 31, 1983**

**COMPUTERWORLD**  
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

# Data Catalog Eliminates Data Base Middleman

By Dale F. Van Aman  
And Mark W. Clark  
Special to CWI

Companies today are rapidly becoming information-starved animals with an insatiable appetite for data. Yet conventional methods of satisfying this appetite, such as on-line, event-driven information systems, simply cannot keep pace with the demand.

Traditional information handling techniques — those of batch and/or on-line computerized systems using structured data bases and developed by computer specialists — can no longer remain as the total solution. Their inherently long development time and relative inflexibility to change are, in fact, contributing to the same information bottleneck that they were originally designed to alleviate.

If the growing demand for information is to be truly satisfied, end users must be involved directly in the data retrieval process, and the process must be dynamic and unstructured.

Generally, users of an information center do not access corporate data files directly, but instead utilize generalized extract routines operated by a member of the information center staff. So while we have moved toward involving the user in the process, we have not done away with the middleman — only changed his title from programmer to information center consultant.

Virtually all of the ingredients necessary to involve the user in the data-to-information conversion and analysis process are a reality today:

*'Virtually all of the ingredients necessary to involve the user in the data-to-information conversion and analysis process are a reality today: individual processing capabilities in the form of microcomputers; networks linking widely dispersed access ports to central data bases; and high-level languages to provide the user with human-compatible data analysis tools. Yet a middleman is still necessary to access the data.'*

individual processing capabilities in the form of microcomputers; networks linking widely dispersed access ports to central data bases; and high-level languages to provide the user with human-compatible data analysis tools.

Yet a middleman is still necessary to access the data. Data extraction is not performed in a real-time environment, thereby creating a critical time delay in gaining access to requested data.

In most large businesses, data is generally captured and stored using a variety of discrete methods, all containing a high probability of discrepancy involving the description and definition of data elements. This makes it difficult, if not impossible, for the end user to assemble the correct data elements necessary to analyze a business problem or opportunity.

At the Essex Group of United Technologies Communication Co., these questions have led to a vision of a user-driven data retrieval capability referred to as a data catalog. The catalog is a concept in which the

information manager assumes the role of the keeper of business data and acts as a centralized control over data element values. Data elements

are linked together in a mode appropriate to allow common data values to be maintained and that permits the end user to extract data logically, and directly without the need of a technical middleman.

With this concept, the conversion of data to information becomes the end user's responsibility using 'friendly data manipulation tools. The importance previously placed on which tools to employ ceases to be an issue.

Conceptually, the data catalog should contain the following properties:

- All forms of computerized data (Continued on SR/4)

## Integrating DBMS With DSS Seen Key to Decision Making

By Miles A. Vogel

Special to CWI

Even though data base management systems (DBMS) have been commercialized and widely used, the effective utilization of DBMS to achieve more effective decision making is questionable until the point that the DBMS is integrated and is the hub of a decision support system (DSS).

Let's first give a definition of these significant management tools as well as an illustration of the traditional approach of file management.

A data base is simply a collection of data logically organized to meet the information needs and time constraints of the entire organization.

These data items are processable by application programs or by the data base information retrieval language.

The data base system's primary function is efficient management of files for information. A total data base system has two main features: one to manage data centrally for many applications and the other to make data available for on-line access.

In a data base system, the data files are organized in a manner that facilitates their use in a multiplicity environment, enabling company-wide usage without modification of the system. Thus, the emphasis is not on a particular application with a specific purpose.

(Continued on SR/6)

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## Depends on Nature of Software

## Relational Systems: Key to Curing Backlog?

By William H. Inmon  
Special to CWI

Not since the 1970s and the clamor to go "data base" has there been a concept so touted as relational data bases. The most loudly proclaimed rationale for relational data bases comes in the promise for the reduction of the ever-increasing user backlog of requests for new systems.

The purpose of relational data bases is to put the development of systems in the hands of users by means of software that is extremely user-friendly, even to the point of being user-reductive. By doing so the user can develop his own system, thus bypassing traditional data processing development. But is this strategy really going to work?

The answer lies in the nature of relational software and in the backlog of user requests. The trademark of relational software is that it is very user-friendly and allows the user to change his mind quickly once the results of processing are obtained.

The typical uses of relational software are threefold. In one application, data is passed from the operational environment to the relational environment. Typically, the processing done in this mode is decision support processing (see Figure 1). A second use of relational software is as an electronic filing cabinet. A third use is by small groups of users for processing a limited amount of data. A typical hardware configuration for relational systems is shown in Figure 2.

But there are some limitations that

*The typical uses of relational software are threefold. In one application, data is passed from the operational environment to the relational environment... A second use of relational software is as an electronic filing cabinet. A third use is by small groups of users for processing a limited amount of data. But there are some limitations...*

are caused by close proximity to data and the concomitant ability to change the usage of the data. These include the amount of data that can be pragmatically handled, the amount of processing that can be concurrently processed and often the concurrency of data.

Practically speaking, relational systems can handle far less data and far less processing than operational systems. Often the data that is handled relationally has been extracted or downloaded from an operational environment, thus being up to date only to a moment in time past.

Another limitation of relational software occurs when the software is run in the micro environment. In that case, the software is limited by the physical capabilities of the microprocessor.

In contrast to the strengths and weaknesses of relational systems are the strengths and weaknesses of the operational environment (which is

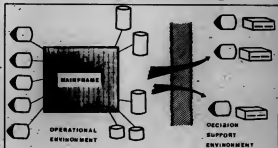


Figure 1

*'Practically speaking, relational systems can handle far less data and far less processing than operational systems. Often the data that is handled relationally has been extracted or downloaded from an operational environment, thus being up to date only to a moment in time past.'*

supported by hierarchical and network data base management systems). The operational environment is capable of handling large amounts of transactions and large amounts of data while maintaining a high degree of system integrity. But the disadvantage of operational systems are that they take a long time to develop and are not easy to change once built.

From a superficial analysis it ap-

pears that relational software will ease the backlog of users' demands for systems. But that entirely depends upon the nature of the requests in the backlog. If the user is asking for a true decision support system or an electronic filing cabinet for very limited purposes, then the backlog will be reduced. But a typical backlog contains only a fraction of these kinds of requests for systems. The user is actually looking for help with operational systems.

What then are the options? The first is to let the request for a new system remain in the backlog queue. In this case relational software has done nothing to reduce the backlog. The second option is to accept the limitations of the relational environment. But this does not really meet the user's needs. Operational characteristics are required (fast response time, ability to handle many transactions, ability to manage large

(Continued on SR/4)

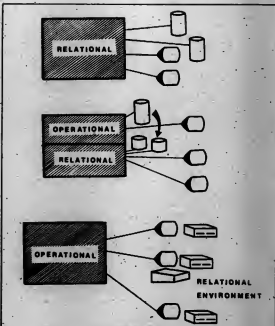


Figure 2

The Gamma Curve:  
Relational DBMS PhenomenaBy Daniel Nolan  
Special to CWI

It happened again. I watched another DP manager draw the Greek capital letter "Gamma" on the blackboard while explaining the growth of data processing in his shop.

"This depicts," he said, "our use of [Software AG of North America, Inc.'s] Adabas and Natural. Notice that it rises sharply, then abruptly levels off, dips and rises more gradually. The peak of the rise is beyond what we had thought our machine could tolerate, but once we adjusted the parameters, it became quite tolerable."

Not so long ago, the threat of reaching capacity was the one thing that would guarantee to blanch the features of even the most stalwart DP manager. You reached the rated capacity of your machine, and you would slow down.

Just as inevitable were the arguments for more machine and a healthy delay waiting for a machine to roll off the assembly line. Once the new box was on the floor, the

work was just beginning. There would be the conversion process as the programs had to be individually fit.

Unfortunately, most DP managers view approaching capacity with the same fear instilled by their forebears. The result is an early launch of a campaign for more and faster equipment. However, throwing hardware at a problem to make it go away is like trying to put out a fire with kerosene.

The result is that the firm is stuck with equipment that rapidly fills with activity but has little evidence of improvement to the end user. The end user begins to question the wisdom of the DP manager, and another resume soon hits the streets.

With traditional processing, each request resulted in the addition of a file, and each new file required supporting audit trails, update controls and constant monitoring. When capacity was increased, the incentive for sharing or integrating data was lost.

(Continued on SR/8)

## Relational Systems and Development Backlog

(Continued from SR/3)  
amounts of data and so on).

The third option is to build the system with relational software as has been tried in several cases. The user uses relational software to build a system that looks as operational as possible.

In the few cases where this has been tried the results have been catastrophic. In one case, hardware was consumed at a tremendous rate, and the user was still dissatisfied with the operational system.

### Data Catalog Eliminates Middleman

(Continued from SR/2)  
(for example, voice, data, text and video).

- Menu-driven and user-prompted.

- A published (on-line or hard-copy) shopping list of available data elements.

- Availability to all authorized end users utilizing any computer terminal.

- Ownership, authorization and security schemes.

Data in any form can be added to the data catalog without affecting data already stored. Data element names and values are centrally managed. The end user can retrieve various data elements with user-friendly tools and join them together with data from personal sources to represent the collective data view necessary to resolve a specific business problem.

#### Stored in Catalog

The unique views can then be stored in the catalog, if desired, for subsequent future use. The user is free to interact with data dynamically, based on business requirements, and can thereby effectively model his changing business environment.

Authorized access to any data element in the company data bank can be obtained via the data catalog. User views of data contained in the data catalog include descriptive information about data elements, their relationships to other elements and the ownership and security levels required for access.

At no time is the user forced to consider any complex data relationships or interface with a technical middleman in order to access the desired computerized data.

Vas Aron is manager of technical support, and Clark is data administrator at United Technologies' Essex Group.

How much is user happiness worth when the cost is measured in a new mainframe every few months?

User-developed systems display characteristics of Richard Nolan's first stage of evolution. In this stage, when areas are penetrated by the computer, there is a "nurturing of innovation"

and a loose amount of control. These characteristics are found in end-user-developed systems.

Because of the similarities identified by Nolan, it is worth asking some pointed questions.

Is the user in the infancy of recreating the data processing department? And if

so, is relational software appropriate? Will the user have to go through all the mistakes made by DP managers in an industry that is still immature? Is the user any better equipped to run the data processing department than DP management?

It is clear that relational software will address the

user backlog of systems development requests for a limited area. But when the request is for an operational system, relational software is inappropriate for systems development.

Inmon is a director at Coopers & Lybrand in Denver; he is an author on the subject of data base design.

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# DBMS Integration Necessary for Info Center

By Marilyn Bracy

Special to C/WJ

Many information centers have achieved success largely because they capitalized on the features of today's friendly data base management system (DBMS) software.

These systems have recognized the management of

data as the "hub" function of an information center. The DBMS must not only service the ad hoc query need directly, but also service specialized analytical needs for specific information centers.

The most critical feature of an information center DBMS is an easy-to-learn, concise, ad hoc query com-

mand language, which must deliver consistent results regardless of the data base design.

The data base structure must be transparent to the user. The language must be rich with defaults. With few command words, a user must receive clear, well-formatted output. The same command

language must enable the nonprogrammer to save the results of the query as a personal data base for further subset problem analysis.

For users of specialized financial or statistical software, the role of the DBMS is different. The DBMS either provides those capabilities through its single command

language or, transparent to the user, provides data load and refresh services through the analytical data base of a separate package. At any rate, the end user will only learn one command language well. This capability exists today and works extremely well.

Successful information centers have introduced the information center DBMS into corporations that already have a production DBMS. They recognize that not only the required features, but also the types of data usage of the information center systems are unique.

## Opportunity for End Users

Many information center staffs are also utilizing the information center DBMS to allow end users to develop their own small applications. With the DBMS screen-development tools, dialogue languages and a minimum of effort, the information center staff can develop a friendly, user-oriented applications generator similar to those available on the personal computer.

For personal desktop types of applications, the Help facilities prompt the user for a description of the data required, develop the simple data base structure and provide data entry screens and update procedures.

Utilizing a fourth-generation language DBMS, the professional programming organization is becoming responsive to developing small interactive production-type systems or prototyping large-scale systems to verify user requirements.

Information center users today want support for personal computers, responsiveness to data access requests for corporate and external data banks and integration of text management capabilities with the information center data management functions.

There is a demand building for more powerful DBMS software to assist in integrating the information center and its users to provide the total corporate office systems solution.

The information center staff is expecting the DBMS to resolve these problems. To integrate the information center personal computer user to the host, the integrated personal computer DBMS must function identically in stand-alone or host-connected mode to process and provide data to the end user.

Integrated data base  
(Continued on SR/10)

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# Cincom Systems

# DBMS: The Hub of Effective Decision Support

(Continued from SR12)  
disc I/O requirements, but on the total needs of the company.

A DSS is a collection of data (organized in a DBMS) that is transformed into information for decision making and actions by utilization of models, statistics, graphics, simulation and optimization routines and various other analytical tools.

The DBMS is conceptually the central focal point of a DSS. In essence, the DSS is extremely vulnerable and dependent upon the efficiency and effectiveness of the DBMS.

The DSS should supply information to the three types of managers: executive, managerial and line.

There is a need to bring the individual retains control over the computerized decision-making process and brings his judgment and expertise to bear on the whole process of problem solving. DSS allows the manager to

utilize the query capabilities of the computer (DBMS) to obtain requested information and to retain control over the decision-making process as changes occur.

Building on the capabilities of the DBMS, DSS are re-oriented to produce information to support specific decision processes.

Fundamentally, the main thrust of the DSS is toward decisions in which there are sufficient structures for computer and mathematical or statistical models to be of value, but where the manager's judgment is essential.

DSS must be designed to allow for combining computerized output with managerial judgment for producing meaningful information to support the final decision. Basically, meaningful information is the rearrangement and classification of computer output that managerial judgment suggests for the decision-making process. This rearrangement is handled specifically by the DBMS.

## Synergistic Interaction

DSS/DBMS can synergistically interact. The following illustrates the integration of these tools:

DSS must be broadened in its approach to decision making — DBMS must support all three levels of management.

DBMS structure of a DSS needs to be both horizontal and vertical. It has a horizontal axis, which is the moving data base element. Data must be available for marketing, research and development, manufacturing, finance, human resources, sales and so forth. On the vertical axis, data should be available for the three levels of management.

Analytical tools of DSS must have easy access to DBMS.

DSS must be capable of solving structured, semi-structured and unstructured problems while the DBMS facilitates this activity by using its easy-to-use query capabilities to obtain information by request.

The type of data base must complement the types of problems and decisions to be made in the DSS. A hierarchical data base tends to work better with a structured DSS, a network data base with a semi-structured DSS and a relational data base with an unstructured DSS.

In summary, the integration of DSS/DBMS satisfies the essential criteria of a support tool for the decision maker because it:

- Supports, but does not replace, decision making.
- Is an easy-to-use interface between man and machine.
- Has interactive and ad hoc capability.

Vogel is director of management information systems at Becton Dickinson Vacutainer Systems in Rutherford, N.J.

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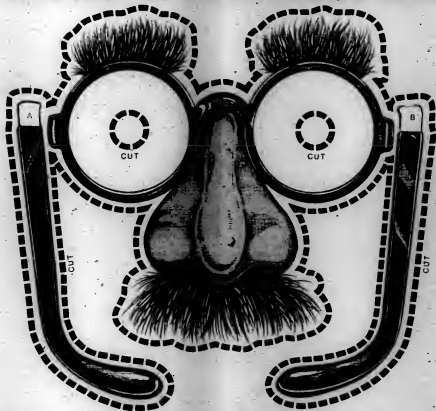
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1. Datapro "User Ratings of Proprietary Software COMPLETE" November 1982. 2. Computerworld, December 20, 1982.

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## Customizes Information for Clients

## DBMS Gets High Ratings From Nielsen

DUNEDIN, Fla. — The media research division of A.C. Nielsen Co. here, the world's largest market research organization, is helping customers tune in to their target television markets with a newly installed data base management system (DBMS) from Computer Corp. of America (CCA).

"We've traditionally provided ratings to our clients in either paper or computer tape form," said Eric Adler, A.C. Nielsen's director of production research. "But now the broadcast industry is changing. Viewer alternatives are growing fast, and our clients need faster, more specific information."

In January, Nielsen installed CCA's Model 204 DBMS. The system provides clients with more customized ratings services delivered electronically whenever needed.

"We've used computers to store and organize our information for years," Adler said, "but with so much data and so many clients, we weren't able to customize information for each client's needs."

"We would make up huge research books, and we'd tell our clients where to look for the information they wanted. But they'd have to do the looking, then make up their own evaluation spreadsheets based on these figures. Now we'll be able to do that for them."

A.C. Nielsen began evaluating DBMS software two years ago, according to Adler. With more than 600 users and a growing diversification of research areas, including cable, the DBMS would have to be capable of handling very large volumes of information at high speeds.

"We wanted a system that had a central data dictionary, that could hold a large number of records, that had an easy query language, that would support both CMS and MVS operating systems and that had strong monitoring and tuning features," Adler said. Nielsen selected Model 204 because of the high-performance query potential of its "inverted-file" data structures and its powerful monitoring and performance-tuning facilities.

"We're projecting that the CCA system will hold 60G to 100G bytes of data on-line for instantaneous use by our subscribers," Adler said. "This information will include a variety of demographic breakdowns for each network, television station and program covered and will extend back multiple years for national and local surveys."

"There are three basic types of file structures used by DBMS," he said. "The chain-pointer type, with embedded pointers that relate records and files to one another, is efficient for updating information but cumbersome for queries because you have to navigate through the pointers to get your information out. The relational type is strong on query handling, but it's not very efficient in terms of machine resources."

"Model 204 uses a proprietary inverted-file structure, where each

data item has one or more — maybe 10 or 20 — indices that relate to other records, files or data items," he said. "It's very quick for queries, which was our primary objective, but updates can slow down an inverted-file system because updates to records also have to update all related indices. The Model 204 solves this problem by allowing users to update records only, deferring updating of indices until a time when query traffic is down."

The system will handle as many as 100 users simultaneously, and many of these people will perform some time-consuming queries to get their custom demographic ratings information, Adler said.

Combining IBM's CMS with Model 204 should give users the easiest means of customizing the information they need, Adler said. An example is in long-term trending, which uses Model 204's file-grouping features.

"We report our national figures in two-week intervals and our local figures many times a year," he said. "So if a user wants to do trending for, say, two or three local reporting cycles, he can request the May/July/September cycle information, and

Model 204 will automatically join these together so they look like one file to the application. The separate files don't have to be rewritten, and the user doesn't have to go through a number of indices to get at this information."



Eric Adler, A.C. Nielsen's Director of Production Research

## Viewing the Gamma Curve As DBMS Phenomena

(Continued from SR/3)

Also lost was the ability to control data as a resource by having a single point of control for each field. A time card, for instance, became many records concerning labor, employment, benefits and expenses.

## The Relational Alternative

The relational data base management (DBMS) shop is able to supply user views of a single data base. Employing the data dictionary, the file is identified once for each end user. This user view is given a unique name, and every interrogation made by the user with the programming language refers to that name.

As time passes, the user may need to add information. This is no problem if the field is added to the file and to whichever views need it. Other views not needing the data are unaware of its existence.

In addition to keeping the auditing and support confined to a single file, security becomes quite simple. Each field has only one "owner" or person entitled to update the field, and that person can grant access to another "user."

Are you serious about end-user satisfaction? The only way to do this, short of changing careers, is to look at the newer relational DBMS packages. If you listen to the salesmen, however, you may get the impression that all you have to do is buy it and sit back.

What you have to do is view your machine as just that — a simple machine. Your team will have to be divided into a data base administration

— instead of a single administrator — diverting attention to each of three areas:

- Operations and systems, which control the equipment and work flow.

- DBMS internals, which keep watch over the visceral parts of the DBMS package and make certain that all parts are in synchronization.

- DBMS applications, which assist the developers who are responsible for setting up the machine to do work for the end users and who are themselves responsible for making enough money to pay for the machine. This job includes so many activities that it justifiably employs more than one person.

In essence, a data base administration is responsible for delivering guarantees. The major part of the administrator's day will be spent in identifying which duties he is competent to perform and which rightly belong to other staff members.

The tail end of the gamma curve lifts upward. This indicates a renewed expansion, which is more realistically paced to the expectations and expenses of the end users.

Auditing and support functions have been reduced. Integration has reduced maintenance to virtual non-existence. Since tables handle most adjustments, even the most rapidly developed systems remain effective to the point where they are made obsolete, not by technology, but by the environment changing so radically that a new project is begun.

Nielsen is director of business data processing at Computer Sciences Corp.

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# Software Tools Ease Firm's System Conversion

ST. LOUIS — Navco Corp., a diversified direct-writing insurance company, has a history of providing new customer services with a minimum of staff resources.

Recently, Navco used the same approach in redesigning its in-house software using Software AG of North America, Inc.'s Adabas and Com-Plete.

The new implementation strategy has resulted in systems that are easier to create, modify, maintain and extend — while delivering faster response and greater accuracy, company officials said.

Navco is made up of subsidiaries offering personal property and casualty insurance. In 1981, Navco handled over 65,000 policies in its personal lines, with total annual premiums in excess of \$50 million.

As a direct writer, Navco handles almost all its policy activity itself rather than through independent agents. This approach places high demands on the company's customer service representatives and requires sophisticated on-line computer systems.

"The company's growth has been achieved through the concept of

computer-based data access to support our telephone operations," said Ron Egger, Navco's data administrator. "Our reps need to be able to locate policies in seconds, even if the customer doesn't have the policy number available. They need to be able to calculate policy quotes quickly. And we need to be able to keep our data files current, so that anything that comes in the morning's mail is in the files by afternoon."

Navco's computer operations run on an IBM 196 Model 3 and a National Semiconductor Corp. AS5 with nearly 9G bytes of on-line mass storage.

Jose Mora, Navco's vice-president of data processing, said Navco had begun looking into alternatives to using Isam files about 1 1/2 years ago. "A data base management system was clearly called for," Mora said. "And Navco's analysis determined that Adabas was the most user-friendly of the packages available which also met our other require-

ments such as operating environment and file sizes." Egger was brought in as Navco's data administrator to implement the system changeover.

"Navco had already decided to convert to [IBM's] OS and had chosen Com-Plete as the teleprocessing monitor," Mora said. "Com-Plete has both TSO and CICS functions and can handle all the terminal I/O involved in transaction processing."

The original plan was to convert the existing personal lines' Isam files to Adabas file structures and convert the existing programs to run in the Com-Plete environment and access the new data structures, Egger said. "But when we looked at the existing system carefully it became clear that it wasn't going to be a simple conversion. The old system was completely inflexible. What we had on our hands was a total system redesign, rewrite and rebuild."

An analysis of programs showed (Continued on SR12)

## Role of DBMS in Info Center

(Continued from SR15)

definitions and data transfer utilities are also necessary.

The DBMS must be closely linked with the corporate data directory for locating any required data as well as to process information center data base load and refresh routines. These information center requirements highlight the need for establishing a corporate data administration service.

Through such a service, data analysts would initiate user definition of long-term data needs and develop multicorporate data services.

The integrated data and text man-

agement system is as elusive as the distributed data base software, the active dictionary and the data administration function. Limited capabilities exist today for automating the communications results of an information center analysis by integrating the data with text.

It is not clear today if the information center DBMS will fulfill the needs for finally integrating these information centers with development centers to achieve integrated business systems.

Bracy is marketing manager for information services at Boeing Computer Services Co. in Vienna, Va.

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Applications development and maintenance have long been overly complex and time consuming. DB1 was designed to significantly reduce development and maintenance time by fully integrating an advanced application generator, a comprehensive data dictionary and a data base management system.

**DB1 is a single software system with one user interface.**

The components of the system are:

**UNIVERSAL TRANSACTION PROCESSOR (UTP)**, the Application Generator, that processes update or query transactions. Both systems and user transaction are entered into DB1 through the UTP in fixed format, free format, or through formatted screens. The UTP may be accessed either on line or in batch. For each input transaction, the UTP updates the data base and involves all the processes that are triggered by the update operation. The UTP also has retrieval capabilities using the same transactions used for update operations.

**COMPREHENSIVE DATA DICTIONARY (CDD)** in which the system keeps definitions of data structures, transactions, screen dialogues, triggered processes, security profiles, and documentation texts. The CDD also contains automatic program documentation and data base maintenance information. A complete cross reference exists between all items in the CDD. Moreover, the CDD supports naming of data items in any two languages.

DBMS fully integrated with the application generator. As a DBMS,

DB1 offers integration, centralization, and coordination. All the common functions of a DBMS are supported including data security, recovery, and data independence.

## DB1's unique features:

### 1. Dynamic Systems Analysis and On-Line Development — With

DB1, the analyst designs and tests the system on-line. After defining the data structure, the analyst

can test the validity of the design and immediately return to the end user with formatted screens. The end user and the analyst can therefore visualize the project at an earlier stage of design and revise concepts with greater ease.

### 2. Immediate Testing and Check-out — Testing and check-out are accomplished

immediately at definition time through the Universal Transaction Processor (UTP). It functions on line and each step of the data base definition can be tested without compilation and system set-up. The analyst has immediate turn around and verification.

### 3. Elimination of Application Programming — This is accomplished through triggered processes, transactions. One of the

most powerful features of the DB1 system, these dynamic operations enable the systems analyst to set in motion a series of checks, computations, and updates as a result of the successful update of a component in the data base. Thus, an externally entered transaction may activate a series of derived transactions.

### 4. Automatic Documentation — Audit and documentation are provided at each level of documentation automatically. Application specifications are entered as data definitions and are maintained by DB1. Structured printouts of the definitions are readily listed. DB1 generated applications are self-documented and the absence of the original analyst does not impede application maintenance or further development. All documentation exists as an integral part of the data base structure.

### 5. Simplified Maintenance — Data definitions can be added, changed, or deleted on-line with little effort or expense. The analyst can also add new fields to segments, attach additional segments to records, and create new files and applications in his data base without affecting the existing application system.

### 6. Fast Installation — DB1 can be installed in the VM/CMS environment in one hour; for MVS, OS, DOS, less than one day. All applications are transportable across all operating systems.

**With DB1, you get:**  
• Better Management Control and Reduced

FEATURES COMPARISON	
Application Generator Fully integrated with CDD and Data Dictionary	Application Generator Fully integrated with CDD and Data Dictionary
Triggered Transactions and Processes	Triggered Transactions and Processes
Automatic Documentation and Printouts	Automatic Documentation and Printouts
Automatic Generation of End User Access	Automatic Generation of End User Access
Interactive Trace Facility	Interactive Trace Facility
Involved Language Interface	Involved Language Interface
Micro Office	Micro Office

**Costs** through DB1's self-documenting features, superior final product, rapid implementation and ease of maintenance. Substantial savings occur in the areas of computer and material usage, and more importantly, programmer time.

**Greater End User Satisfaction** because the end user receives his final application system sooner, fully tested, and more in accordance with his real needs. In addition, the application system is flexible and open to change even after it is in production.

**Increased Programmer Productivity**, up to 1,000%. Over 35 installations worldwide already report significant increases through the implementation of DB1's unique capabilities.

DB1 is available now and costs 1/3 less than the comparable systems of its major competitors.

And, because it is a single software system (as opposed to two or more separate packages), initial installation time and subsequent maintenance costs are significantly lower.

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Reaching Out via Telephone

## And Monitors Growing Needs DBMS Tracks Telephone Activity

NEW YORK — At the New York headquarters of American Express Co., reaching out to touch someone via telephone will result in an estimated \$9 million telephone bill in 1984, a jump of almost \$2 million over the previous year.

American Express averages over 100,000 long-distance calls and more than 300,000 local calls each month from its headquarters.

The size and growth pattern of this expense taxed the monitoring, analysis and reporting system on telephone billing that was developed

by the company in 1975.

Although the original assembler code was modified with numerous Cobol modules over a six-year period, the organization still suffered from application change request backlogs and an overburdened traditional systems development staff.

The American Express, General Services Office, which was responsible for administering telephone usage expenditures, called for a data base management system (DBMS) flexible enough to allow the development of an application tracking

the company's telephone usage patterns that could be easily altered to reflect expanding needs.

It chose Rami II, the fourth-generation language and DBMS from Mathematics Products Group, Inc.

Alan S. Zaben, manager of the  
(Continued on SR14)

## Insurance Firm Uses DBMS, Cuts Response Time

(Continued from SR10)

that most performed one of two types of activity: either on-line transaction processing involving a single formatted screen, minimal data base I/O and interactive screen writing or batch reporting, presenting sorted line lists or summaries.

"We discovered that the bulk of the actual code involved could be expressed in a small number of nearly identical portions," Egger explained.

"The programs used map definitions, map request control blocks, definitions of field-control tables and so on, and every program needed data base calls. We preceded these generally used paragraphs up from Com-Piete, tested and debugged them and made up a library of these pieces in the form of program stubs."

Once the department had these building blocks accumulated, it used them to put together the actual new programs. Using a Com-Piete utility that performs program concatenation, it assembled a program. Then other Com-Piete utilities set the programmer code in specific values, field names and editing requirements, compile, test, edit the new program and retest without getting up from the terminal.

Egger said Adabas allowed the department to get data into a form that could be worked with more easily. "We already had the stub-and-assembly concept; Com-Piete let us implement it easily," he said.

Egger said Adabas and Com-Piete were valuable throughout the process. "First, both systems operate at the call level, which makes coding programs much easier. Secondly, running under Com-Piete lets us work on-line and interactively, so program turnaround is rapid," he said. "Like any DP department, we used to be swamped with ad hoc requests." Mora added, "By installing Adacom, Software AG's report writing package, we've been able to let managers handle these for themselves."

He added that a number of chores that used to be done by hand have been automated. "Instead of having the staff sort through thousands of 3-in. by 5-in. cards to check dates and numbers, all this is now done automatically," he said. "We're now getting faster response time at the terminals, because Adabas only retrieves the part of a record actually needed instead of all of the record like Iam did."

## See COBOL.

Dick is a COBOL programmer. Dick is bored. Harried. Dick struggles with trace and debugging routines. Nonexistent documentation. Mainframe logjams. So Dick is four months behind schedule. And users are upset about turnaround times. They yell and make Dick upset.

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# Planning Ahead Can Cause Data Base Disaster

By Frank Sweet  
Special to CWI

If you look ahead and try to design files to be shared by future systems, you'll probably fail. So don't try to do it right; just do it.

The concept of an integrated data base is straightforward: Redundant

(duplicated) data tends to become inconsistent rather quickly. It is easier to use one shared pool of master files for all applications in the firm. It sounds reasonably simple.

Why then are there horror stories of data base projects taking years to implement? Why do some data base applications become so unending, and so time-consuming that management finally despairs of pouring money down the hole and slays the monsters? The answer is that file designers are sometimes lured into the fatal trap of trying to foresee the data needs of future applications.

Imagine a systems analyst faced

with designing a billing system under the data base approach. Among other tasks, he must design a record layout for the customer master record.

He interviews users, finds out what they want and eventually comes up with a layout that includes every field needed by the system on which he is working. If he was not using a data base, he would be done.

But the customer record will be shared by many future systems other than billing. Shouldn't the systems analyst find out what they need and include that also? If he does not, he will just have to redesign the customer

record every time he does a new system.

However, in order to find out what other systems need, the analyst would have to identify every field, every data element and every attribute of "customer" that any user could ever want for any possible application that might ever arise. The more he learns, the more future potential applications would come to mind. This would bring up more data needs that must be investigated. He would be trapped in a closed loop of user-application data user.

What about the problem of retro-  
(Continued on SR/20)

## Firm's DBMS Monitors Use Of Telephone

(Continued from SR/12)

General Services Office at the headquarters facility, wrote the entire series of programs required for the new expense and monitoring application. The application, which had been requested for development using traditional means for over 24 years, was completed in one month by Zaben with the guidance of American Express' information center.

Zaben designed the original application to look at expenses by telephone number and to report on traffic patterns. The application also is used to determine the impact of rate increases on the total telephone expense and to advise management of actual and potential expenses.

Since its original design, the application has changed to include new reports and changing formats as often as every month, Zaben said. One of the changes added a cover sheet to monthly reports that features a six-month breakdown of average expenditure by month. The changes in data base design were completed by General Services Office personnel within a day.

According to Zaben, the New York telephone company provides five tapes each month that list telephone charges and the types of telephone equipment and services used by American Express. This data is then read into four disk files accessible by Ramis II. The data in each file reports in more than 20 monthly reports.

### Malfunction Identified

The ability to track calls has saved the company money. A previously undetected technical malfunction in the Wats system was identified in the data gathered for a Ramis II report from the application. The malfunction had been costing the company an additional 17 cents per call.

"The system also is designed to pick up any changes in use or over-abundant calls to an area code or exchange that is not extensively serviced by our company," Zaben added.

Cost savings of up to \$600 per month in one department alone were realized by this application.

The company's information center personnel assisted in setting up file descriptions for the application. Zaben now uses the information center personnel as a sounding board for ideas on enhancements to the application as it evolves toward more extensive and sophisticated analyses.

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## Used in Japan's Fifth-Generation Project

## Prolog Language Includes Relational Data Base

By Kamran Parsaye  
And David Warren  
Special to CWI

Prolog is a simple yet extremely powerful language invented at the University of Marseille, France, in the early 1970s. It is a declarative language whose design includes a relational data base. It has been chosen by the Japanese as the language on which their fifth-generation computer systems project is based.

Prolog is based on pattern matching and "if...then" rules. A Prolog program is simply a collection of

these rules. Prolog, in effect, uses an internal relational data base to store these rules and then applies them by pattern matching.

Prolog is a declarative, or relational, language. It computes relations, just as functional languages like Lisp compute functions. Programming and relational queries are combined very naturally and effectively in Prolog. Due to its deductive capabilities, Prolog can be viewed as an advanced and powerful relational query language that may also be used for general programming.

Prolog is suitable for rapid application development in conjunction with relational data bases. It has been used in applications from data base integrity control to natural-language comprehension.

Early structure-oriented data base systems such as IBM's IMS or Codasyl relied on structures, such as trees and networks, that depended on navigational searches. For example, users of IMS store their data in trees and retrieve them by explicit search operations. They need to be aware of the underlying structures used by

the system.

Relational data bases rely on a more abstract method of data management by computing relations. Users no longer need to be aware of lower-level implementation details and simply view results in an abstract form.

Similarly, programming languages such as Fortran, Lisp or Pascal are structure-oriented since the programmer needs to create structures such as arrays, lists or stacks to store and retrieve information. For this reason, relational query languages need to be explicitly embedded within structure-oriented languages such as Cobol. For example, a Cobol programmer needs to leave Cobol to write an IBM SQL query.

## Data Base-Oriented

Prolog is not a structure-oriented language. It is a data base-oriented language since it uses an internal relational data base rather than more common structures such as arrays or pointers. Programming in Prolog can be viewed as programming by assertion and query.

The Prolog programmer is not aware of the distinction between programming and query; he simply stores information in the internal relational data base of Prolog and retrieves it by powerful logical queries.

Relational data bases are based on relations. Prolog is based on logical predicates. There are essential mathematical reasons connecting the mathematics of relations with logical predicates. The semantics of both Prolog and relational data bases form a subset of first-order logic known as Horn Clauses.

The close relationship between Prolog and relational data bases can also be seen with simple examples. A relation can be viewed as a predicate that asserts the truth of facts.

Relational data bases view the world in terms of relations and tuples. For example, the relation "father" may include the two tuples "John, Mary" and "David, Sara." Data is retrieved from relations by using a query language such as SQL. Prolog views the world in terms of simple logical predicates whose truth is asserted. Thus, one can assert the truth of two instances of the "father" predicate. For example, the Prolog equivalents of the two tuples from the "father" relation above are father "John, Mary" and father "David, Sara."

Essentially, each relation name in a relation data base is treated as a predicate in Prolog. Prolog is more powerful than just a relational query language. It includes recursion, pattern matching and deductive capabilities.

Relational data bases and Prolog are moving fast toward a common destination. This holds true both in terms of functionality and performance.

Processing deductive natural-language queries in Prolog is now a  
(Continued on SR/20)

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Tandem's NonStop network solves the problem.

## A NETWORK OF NETWORKS

With a Tandem information system, it doesn't matter where you're sitting—you've got complete and instantaneous



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*By putting the most often used data on the local system, you get faster response time and lower communications costs.*

*A single, distributed database lets users at any locations...*



*access information or update the entire network...*



*automatically right from their local terminals.*



access to the information you need—regardless of whether it's across town, or clear on the other side of the world.

The reason is simple. Each Tandem NonStop computer system has been designed from the ground up as a total information/communications system. Which means that each system is actually a self-contained network. A network that encompasses interprocessor communications in a single system at one physical location, and extends all the way to a 255-system configuration spread across the globe.

## Working the way you work.

This approach to system design conforms to the way information is ac-

tually used and communicated throughout an organization—at different times by many people in various locations and at different levels of responsibility. That means that you can place the information you deal with most on your local system, giving you better response times for your users, lower communication costs, and independence from any problems that might occur at other points in the network.

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☐ Vice President ☐ Division Manager  
☐ Department Manager (specify) \_\_\_\_\_

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☐ Other (specify) \_\_\_\_\_

What are your company's annual sales?

- ☐ Under \$100 million ☐ \$500-\$1 billion  
☐ \$100-\$500 million ☐ Over \$1 billion

Which one of the following most closely describes your business classification by end product or service?

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☐ Manufacturing ☐ Service Bureau  
☐ Wholesale Trade/Retail ☐ Federal Government  
☐ Transportation ☐ Other \_\_\_\_\_  
☐ Communications \_\_\_\_\_  
☐ Medical/Hospital \_\_\_\_\_

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## THE KEY IS A SINGLE, DISTRIBUTED DATABASE

Tandem's unique ENCOMPASS™ DBMS actually distributes a single, unified database across the entire network, providing your users with two important advantages: first, no matter

where they are on the network, they can access data from anywhere else, without having to know where the data is located.

And second, by simply entering information at their local terminal, your

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At corporate headquarters, management has network-wide access to continuously updated information for operations and reporting

users are instantaneously updating every single node in the system — automatically.

## Relating data to information.

The key to manipulating data in such a simple, straight-forward manner is Tandem's high-performance relational database. Because setting up files merely involves creating or filling in tables with data records, no device-dependent "pointers" are used to maintain relationships, making the database extremely easy to use.

New files can be set up at any time, in any location — just by adding new tables or rows. This allows you to reconfigure your data files as needed, transferring the most often used files to the local node. So you can be continually fine-tuning your system, moving your data to where it makes the most sense, with no penalties in performance. In the process, you are reducing the float on information by dramatically lowering user response time, as well as saving network resources and increasing overall system performance.

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## The data protection solution.

On the software side, our ENCOMPASS database manager includes a special subset called the Transaction Monitoring Facility (TMF), which is devoted solely to ensuring network-wide data integrity and recoverability.

With TMF, the system maintains an audit trail of all transactions, protects files from access when the database is in an intermediate state, and provides complete backup and roll-forward recovery procedures if a transaction cannot be completed for any reason.

In addition, Tandem's GUARDIAN™ operating system complements the ENCOMPASS database manager to oversee all aspects of NonStop architecture, ensuring that all database linkages are consistent at each node of the network.

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## With Prototyping

## DBMS Cuts Firm's Software Development Time

MCLAN, Va. — Maximizing resources for its management information systems (MIS) staff was the goal BDM Corp. had in mind when it went shopping for a data base management system (DBMS).

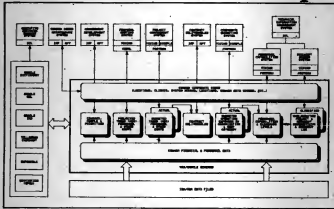
BDM, a professional services firm located here, performs system design, engineering and testing for clients in the defense, communications, energy and banking industries. With 300 to 400 contracts active at any given time, both MIS and non-MIS personnel are involved in developing applications for company clients.

A \$7 million overhaul of its batch-oriented corporate MIS system resulted in a three-level MIS system using an IBM mainframe, Digital Equipment Corp. minicomputers and various microcomputers.

Two DEC VAX-11/780s networked with Decnet are located at BDM headquarters. A third, which will also be networked, is being installed at BDM's Technology Applications Center in Albuquerque, N.M.

An IBM 3033 running MVS uses modified Management Science America, Inc. financial software to handle BDM's accounting. The MSA software produces transaction files that are then downloaded to the VAX machines via IBM 2780/3780 protocol emulators.

Approximately 20 microcomputers of various kinds



MIS Conceptual Software Architecture

Chart Courtesy of Oracle Corp.

are used in corporate MIS applications by BDM's field offices and executives on the road. The micros perform analysis only.

"We wanted an interactive system for our project design," stressed Mark Filteau, director of Systems Design and Integration. "Detailed financial accounting would remain on a mainframe, but our management decision support information had to be interactive," he said.

A deciding factor for BDM was that most of its applications are relational in nature, and most have very complicated data structures, he pointed out. BDM selected

the Oracle relational DBMS from Oracle Corp. in February 1981 after looking at about 50 DEC-oriented data base systems.

Oracle was up and run-

ning in April — one month after its delivery, Filteau said.

"Most of the packages we examined were just file managers under the skin," Fil-

teau recalled. "None were as powerful as Oracle. But the driving factor to use it as the primary data integration tool was its ability to support data access through traditional host language applications, ad hoc queries and its own applications generator."

One facility BDM found attractive was SQL Plus, Oracle's extension of the SQL data language developed by IBM. "You can define data in Oracle with common, everyday names that are meaningful to non-DB people," Filteau said. "Whereas other data base systems required their users to know physical link paths, all we had to do with SQL Plus was post pictures of the data tables on our walls. Its simplicity enabled our 26 programmers who work with the DBMS to get up to speed quickly."

The biggest payback to BDM came in prototyping applications using Oracle's Interactive Application Gen-

(Continued on SR/24)

## Time-Relational Model Integrates Time Processing Into DBMS

By Jacob Ben-Zvi  
Special to CWI

The time-relational model is a new architecture that integrates comprehensive and complete time-processing capabilities into the relational model of existing data base management systems

(DBMS). It allows users to operate only upon the latest data base state.

An important limitation of current DBMS is that information becomes effective at the same moment it is recorded in the data base. There are no provisions for the distinction between the physical time a data item is entered and the time period to which it pertains.

Many data base updates in real applications are either retroactive, meaning that their effectiveness takes place sometime in the past, or proactive, meaning that their effectiveness will take place sometime in the future.

Another limitation is that current systems maintain no history of changes. A previously recorded data item might be changed because of human error, program error or simply because we have learned more about a given data value.

However, many problems require the history of altered values. For example, inserting a retroactive change to be effective at a point between two previous changes may not be possible without the transaction program history.

Rules and logic that manipulate data are also dynamic. Any attempt to provide retroactive and/or proactive processing capabil-

ities must include the provision for the transaction program's history as well as data history.

Lastly, the issue of data base structural changes over time is important. The objective to shield a data base user from such changes is part of the data independence characteristic. Unfortunately, there are cases where even a very high degree of data independence cannot mask some data base structural changes. For example, a deleted column or table forces some changes at the application level.

The ability to manage and perform all these functions is called time-processing capability. It is the fundamental ability a data base user is given to access the time dimension of data.

A conceptual data model that contains these functions is called time-realistic to the end user. Indeed, many of today's applications have been implemented on an ad hoc basis to meet their particular requirements for accessing historical data.

Interestingly enough, the notion of time is somehow embedded in most of the issues concerning centralized and distributed data bases, such as synchronization, consistency, checkpointing/re-

(Continued on SR/24)

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# Time-Relational Model Integrates Processing

(Continued from SR/22)  
start and recovery. For example, recovery is equivalent to taking the data base back in time to the last consistent state.

A fundamental concept in time-relational research is the time view of data and transaction programs. Its major objective is to provide automatically and dynamically multiple and complete data base views reflecting different points in time.

A complete data base view is composed of the data, its structure and the rules and logic that manipulate it, all representing a data base "snapshot." Multiple data base views taken

from different points in time, for a fixed point in time, will not necessarily yield the same results.

For example, a request to view an employee's salary effective Jan. 1, 1982, executed Feb. 1, 1982 and March 1, 1982 may result in different salary values if a retroactive salary change that pertains to Jan. 1, 1982 has been applied between these two execution times.

The time-relational model is based on a centralized relational data base manager coupled with a built-in time mechanism. It increases available functionality for data base users and provides better solutions to such in-

ternal DBMS operations as recovery, concurrency control, synchronization and so forth.

There were three main objectives laid out for this research.

- *Exploring the viability and feasibility of the time-relational model.* The extended user functions, as well as new solutions for several DBMS internal operations, are developed, and some implementation and design approaches are analyzed. The central idea is to gain more functions and solutions based on the presence of time-related information within the data base domain and thus spread the overall operational and implementa-

tion costs of such a model across multiple sources.

- *Providing a high level of time independence.* The addition of this new, time-dimension facility to an existing relational model should not degrade its data independence quality. The term "time-independence" captures all issues of time-access path details, changes of data structure over time, changes of data manipulation rules over time and so forth.

- *Ensuring that those who are not concerned about time in their applications should perceive this model as a regular relational model.* The ability to make the time capabilities transparent for those who operate only upon the current data base is very important. It provides the means for migrating from a relational DBMS to a time-relational DBMS. The time facilities are used only when a given application requires them. Otherwise, they are bypassed.

Ben-Zvi is vice-president of Implementation Systems Development for the Software Products Group of Informatics General Corp. and is visiting professor of computer science at the University of California at Los Angeles.

## DBMS Speeds Development For Tech Firm

(Continued from SR/22)  
erator (IAG), Filteau said. IAG lets users define applications by engaging the user in a question-and-answer dialogue, allowing him to tailor screens for on-line data entry, query and update applications without the need for programming.

"Sometimes the model is so good it becomes the system," Filteau maintained.

"Other times it goes through several iterations. We keep changing it until we get it the way we want it; development with IAG is so fast that we can afford to build prototypes and throw them away," he said.

Once a satisfactory prototype is established, Filteau's staff prepares a software design document covering all data elements with attributes and meanings, relationships among other data elements and logical groupings, the type of access required for each element, the typical retrieval or update path for single or multiple data elements and the anticipated size of the full-scale data base.



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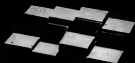
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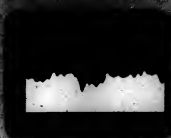
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# Trading System Developed With Aid of DBMS

CHICAGO — Sharpe Trading Systems, Inc. (STS), a software vendor based here, wanted to develop an application system for the securities and commodities industry, but faced the problem of selecting a data base management system (DBMS) that could support the application system's needs.

STS' system, The Trading Instrument Accounting System, requires a sophisticated DBMS that allows on-line inquiry to all members of an investment or brokerage firm.

STS proposed to develop a flexible application system that would provide immediate in-house processing of a firm's trading activities or other firms' trades across all types of trading instruments. Taking current price quotes from a wire service, the system can continually update the data to provide on-line information.

However, STS quickly discovered that designing an on-line system that constantly updates the data base required some special functions not found on all DBMS. The system had to have easy-to-use data description specifications, efficient data storage and retrieval, flexibility to permit change and the ability to expand without requiring the rewriting of programs.

STS discovered that the IBM System/38 architecture integrates certain key elements into the DBMS that not only make it more powerful, but also make it possible to use new, flexible programming methods.



Organized Mayhem on the Trading Floor

According to Rich Sharpe, president of STS, "The System/38's DBMS allows us to view data in any sequence we want to see it and to access the data with remarkable swiftness."

Sharpe admits, however, that the System/38's DBMS is not a true relational data base. Specific operations such as union, minus, intersect, times, project and join are not found on the System/38. Without these operations, STS had to compensate through programming.

The System/38 integrates the data description specifications into the DBMS, allowing programmers to de-

scribe data fields outside the program. Because of this, STS programmers were able to eliminate repetitious redefining of input specifications in programs, which cut programming costs, Sharpe said.

Indexing methods are also integrated into the DBMS and the hardware, providing rapid data access. Its binary radix tree indexing method takes only five I/Os to find any direct access record on the system, no matter how large the file, Sharpe said.

Data base security is integrated into the design of the hardware and the DBMS. Unlike many security systems, the System/38 requires authority to be granted before anyone may access any data. STS further reinforced security with an additional level for the individual customer or trader.

## Categorizes Records

The system's object orientation feature categorizes all records, programs, files and allows the DBMS to store and manipulate the data base more effectively. Not only does it relieve the programmer of having to know where the data is, it also provides easier testing, Sharpe said.

Programming languages are integrated into the DBMS, so the data no longer has to be described in the programming language but redefined in the program, Sharpe said. Many data base changes on STS' trading system only require a recompile of the program without any changes in the code.

The System/38's high-level machine interface permits the data base to be compatible with different models of the hardware and new versions of the operating system, Sharpe noted.

The user can upgrade or change hardware models without making software conversions.

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## A Misguided Data Base Administrator Learning a Lesson From the Saga of Hiram Tech

By Robert E. Lutz  
Special to CWI

Some data base administrators are practical, efficiency-minded team players who are a joy to work with. Others are not. I have seen well-meaning data base administrators waste hundreds of thousands of dollars by insisting on overly complex designs and originating needless project delays. If my observations are typical, misguided data base administrators waste millions of America's corporate dollars every year.

There seem to be two primary reasons for overly complex designs and needless project delays:

- Some data base administrators lack application design experience.
- Most data base administrators are given absolute authority.

Because data base administration is a highly technical area, many administrators are chosen from among the ranks of systems programmers. This has proven to be unwise.

Hiram Tech (name changed to protect all concerned) was promoted from operating system bit manipulator to data base administrator. He attended vendor classes, where he was taught the five commandments of data base theory. They are:

1. All company data, no matter how insignificant, must be entered in My Data Dictionary.
2. All company data, no matter how simple or static, must reside in My Data Base.
3. There shall be no redundant, derived or control information stored in My Data Base.
4. No change to the data dictionary or data base may take place without My Lengthy Delay.

5. None of the above commandments may be violated regardless of the potential costs or savings involved.

Data base administrators with ex-

perience in application design recognize the complexity and added expense introduced into a system by rigid adherence to the above rules. Unfortunately, Hiram had no such experience. He adhered blindly to the theories he had learned and was

eventually fired for incompetence.

The final decision over the shape of a company's data is too important to be made by one person. Hiram would probably have been a great data base administrator had his work been subject to the same quality control sessions as the rest of the development team.

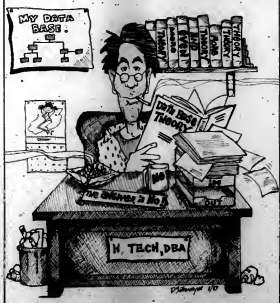
In determining the architecture of the data, applications designers as well as the data base administrator should have input. If a conflict develops that cannot be resolved, the final decision should be made by the head of systems, who will have to live with the consequences.

Misguided data base administrators too often:

- Are idealistic, impractical and theory-oriented.
- Insist on making every file and table a data base.
- Are obsessed with security.
- Make a project of data definition and file design.
- Avoid important design decisions.
- Will not allow storage of any switches, flags or accumulators.
- Are unwilling to compromise, even on small issues.

An efficiency-minded data base administrator with a strong background in application systems design can save you a lot of money in hardware as well as development and maintenance dollars. By all means, subject his work to quality control. It will save you money, and it may save him his job.

Lutz is president of Predictable Systems, Inc. in Chicago.



## A Quick 'Walk-Through' Data Base Basics

By Michael Barnosky  
Special to CWI

The evolution of the storage of data from files to data base management systems (DBMS) is representative of the dynamic aspects of data processing. But working with a DBMS is not always a simple task.

However, a DBMS can be understood through its unique syntax. The variety of words used can be readily seen by looking through the table of contents or index of a DBMS manual.

To approach this large number of new words, have a person who is familiar with the DBMS mark those most commonly used. Normally, they constitute a small percentage of the reserved words. Look up the meaning and use of these and try to understand what they do. The remainder of the reserved words will become familiar as DBMS experience is gained.

Once reasonably comfortable with the syntax, put this new knowledge to work. Ask for a program listing that is fairly easy and uses the DBMS. Usually a print program that accesses multiple record types will do nicely. Acquire any documentation and output reports for the program. These will help provide a basic working

*'A data base organization eliminates the redundant and inconsistent qualities through data structures that form dependencies of one type of data on another... data dependencies and data structures are maintained in a data base through one physical representation of data.'*

knowledge of the program.

After reviewing the documentation, work on the program. First, simply look for the data base verbs used and determine if they are familiar. Look up any new data base verbs in the manual to gain an understanding of what they do. Follow the logic of the program, and study how the DBMS words fit and what they cause the data to do.

Normally there will be I/O access words and other words to qualify further the data being accessed. Once the program's function is reasonably understood, the DBMS will be better understood. Other basic aspects to know are the data structure, data dependencies, flat file vs. DBMS and basic storage and access methods of the DBMS.

The flat file concept, in which data

is represented schematically as one data record following another in a long sequence of data records, is replaced by a data structure. This structure can be represented as a hierarchic structure in which dependent or child data records are shown below a master or father record, as a relational structure in which data records are shown as a circle of records with an owner and its members or as a network in which each data record of a kind can be shown connected to every other of its kind in a ring format. These different data structures give some meaningful advantages to a DBMS over a flat-file concept. One is the elimination of the redundant and inconsistent arrangement of data in flat-file concepts. Redundant data occurs when the same data values of a particular kind appear in more than

one place. Inconsistent data occurs when a data value is changed in one place, but not in other places where that value is stored.

A data base organization eliminates the redundant and inconsistent qualities through data structures that form dependencies of one type of data on another. For instance, a customer name and address relate a customer's order to his name and address values and through data structures that connect these differing values through pointers. In this method, when a customer address is updated, all orders for that customer will then reflect the change because all the orders point to the same address information.

The data dependencies and data structures are maintained in a data base through one physical representation of data. Various programs can view the data in different ways through a logical view. This logical view allows a program to recognize only those data values with which it needs to be concerned.

You only need to be concerned with your shop's particular organization of the data base.

Barnosky is a data base consultant in the Cleveland area.

## From Stalled Development

## Fourth-Generation Languages Rescue DBMS

By Thomas O'Flaherty

Special to CWI

The accepted data base management system (DBMS)-driven system development process is in deep trouble, and fourth-generation languages may represent the only remedy.

The major symptoms of the problem include multi-year visible backlogs, lengthy development cycles that often produce obsolete systems and nonrobust systems that cannot be easily modified.

The very power and complexity of the DBMS has greatly increased the rigidity of the classic system life-cycle process.

Most information systems professionals still view fourth-generation language applications and conventional DBMS applications as inhabiting quite different worlds. Fourth-generation languages are seen as quite useful for small, analytic projects, but they are typically viewed as unsuitable for large, transaction-oriented systems.

However, leading fourth-generation languages can already support sizable production-type systems, such as data files running into millions of records, millions of calls a day against a large data base and dozens of simultaneous users.

In many cases, a significant amount of additional processing resources will be required to perform a task

*'Most information systems professionals still view fourth-generation language applications and conventional DBMS applications as inhabiting quite different worlds. Fourth-generation languages are seen as quite useful for small, analytic projects, but they are typically viewed as unsuitable for large, transaction-oriented systems.'*

using a fourth-generation language (often 75% more resources may be needed). The trade-off is that programming speed can be increased by five times or more.

The real issue is not so much the technical capabilities of fourth-generation languages vs. conventional DBMS-based developments, but the kind of development process that each can support. While in principle a conventional DBMS is flexible and can be changed, in reality this is very difficult to accomplish.

The process is essentially sequential. Analysis, at best, correctly analyzes the situation at a single point in time. And the resulting system reacts very poorly to subsequent changes in requirements, especially where previous data relationships are turned topsy-turvy. Unfortunately, the reordering of data and logical relations are quite common in a dynamic business environment.

For large, complex sys-

tems, the elapsed time during the life-cycle development has become a significant percentage of the system's useful life. The process is horribly complicated. At the same time, there are no effective analytic methodologies that have succeeded in converting a process that is half inspiration and half trial and error into an engineering discipline. However, the life-cycle approach expects a usable design to come out of the analysis phase.

What is needed is a prototype, something at which fourth-generation languages are extremely good at for the following reasons:

A fourth-generation language, up to a certain point, can be quickly mastered by a user, giving users and information systems staff a common language.

Systems can be roughed out, often in a matter of days. This is a critical advantage for letting users see the effects of their desires.

Feedback between users and information systems staff can move forward throughout the entire development process.

Obviously, a fourth-generation language prototype

can have very significant benefits for the feasibility, analysis and design steps by combining them and, even more important, permitting multiple iterations of assumptions and system features to be tested.

The impact of the fourth-generation language can be even larger, although less immediately obvious, in the debugging and maintenance stages. Since the code really is self-documenting, it is easier to identify and correct errors.

Considerable controversy surrounds the wisdom of moving a fourth-generation language-based prototype into production, as opposed to rewriting it as a conventional application. The rewrite's increased operating efficiency (if any) must be weighed against the benefits that will be lost.

Using a fourth-generation language in a production setting does not necessarily

mean that it replaces a conventional DBMS. The issue is not so much the extent to which fourth-generation languages are competing with established DBMS as it is selecting the best strategy for ensuring that the particular fourth-generation language selected complements a conventional DBMS.

Information systems departments that see fourth-generation languages as allies stand a good chance of retaining control over systems and the systems development process. Otherwise, users will wield fourth-generation languages themselves, with unforeseeable consequences.

O'Flaherty is principal consultant in the Saddle Brook, N.J., office of Input, Inc., an international research and consulting firm. This article is based on research conducted for Input's recent study "The Opportunity of Fourth-Generation Languages."

## Project Control for Development Of Data Base Systems

By J. Colbert Jr.

Special to CWI

The data base management system (DBMS) is a welcome addition to the functional tools available for use in most management environments. However, bringing it up with cumbersome system development methods and traditional project controlling restraints is not always pleasant.

While DPers are abreast of current developments in the field, non-DP management

personnel are not. The impact of on-line DBMS project development and use points out a need for educating "just plain folks" and moving them forward with the DP environment.

Those procedural steps once mandatory in development of data processing systems have been reduced to prerogatives for management to explore and use as necessary or to ignore in favor of economy and the

(Continued on SR/32)

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# Project Control Tips for DBMS Development

(Continued from SR/30)

weight of our own needs. Failing to take the most direct route from conception to completion of systems is like ignoring electric starting motors on our automobiles and sticking with the hand crank.

On-line and batch DBMS are dramatically different. Developers of communication systems have long recognized that application of the end item or system influences the development methodology and configuration of the system being designed.

Strategic communication systems must provide precise administrative

and security controls, since material processed by the system is usually sensitive and highly classified. Operation of strategic systems are well defined, scheduled and administered, since the product of those operations is to be used at the highest level of command. Batch data processing is conducted in a fixed, stable and often rigidly scheduled environment using the most sophisticated control techniques available with products designed for use at the highest level of management.

Operational or tactical communication systems design is dedicated toward providing flexibility, mobility

and rapid response, unencumbered by burdens of administration and overly restrictive procedures. The product of operational communication systems is "right now" information. The on-line DBMS is operational in that, users are communicating with and through their data base unencumbered by the need for lengthy data entry, fixed schedules or data processing intervention.

Moving from one system and capability to a new or different type of operation in data processing is often met with frustrating resistance to change. The more established and bureaucratic a management group

becomes, the less it is prepared to accept change. Moving from one scheme of system development to a new or different development methodology often meets with equally frustrating resistance.

Large volumes of procedures have been assembled assigning great credit to tried and true system development methods and project control techniques considered set in concrete for development of systems. The usefulness of sophisticated project management and development control techniques would be hardly debatable as long as DP capability and requirements remain fairly static.

However, conditions in the DP community have not remained as the chart and graph keepers would like. In spite of constraints imposed by management's inflexibility, DP has evolved to a different level of operation — the on-line DBMS.

## State-of-the-Art Tools

Fourth-generation programming languages, heuristic compilers and DBMS software are state-of-the-art tools available for DP systems development. The need for agonizingly slow development procedures, elaborate development schedules and stringent project controls is challenged by current DBMS development methodology.

Comparisons between communication systems and data processing systems exemplify the impact of end-use application on design and development of the systems. Design, development, installation and use of either communication systems or data processing systems must be given the same considerations by development engineers.

The intended application of systems being designed should influence non-DP management thinking to evaluate the usefulness of controlling DBMS project development with the same muscular stick as that used for batch processing systems.

Data processing professionals are armed with knowledge of DBMS development using fourth-generation technology. Non-DP managers and engineers must be moved forward to embrace that technology if the industry is to take full advantage of evolutionary system development.

Coffert is involved in security administration at Computer Sciences Corp.

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## Making Data Bases More Usable

## Extended Query Systems Allow Rapid Updating

By Michael R. Stadelmann  
Special to CWI

Data bases are being updated faster and more accurately than ever before as extended query languages nearly eliminate the need for programming languages during the development of data base applications.

These systems — often referred to as fourth-generation languages and application generators — are an important contribution toward making data bases more usable. A query system allows users to specify results desired rather than the specific

method for achieving those results.

It reduces the amount of instruction needed to request services from a data base management system. The desired results are stated as the selection of data items to be displayed, the order in which these items are to be displayed, functions to be performed for the data and so on.

Updating causes changes in a central repository of data. For example, records can be added, deleted and modified. Extended query languages use keywords, modes or other techniques to indicate the particular op-

eration to be used.

Updating a data base requires more extensive data input than retrieval. When a record is created, values for several or all fields of the record are supplied. When a record is modified, values for those fields being changed are specified. Record deletion tends to resemble retrieval in the nature and quantity of input data required. Usually, only key values are specified for those records to be deleted.

A query system performing retrieval handles formatting of output

data. Users need not be concerned with this relatively mechanical chore. Likewise, an extended query system performing updates formats input screens as well.

Field labels and input data areas are distinguished. Fields are separated properly, and they are spread out rather than compressed into a small section of the screen. Default screens should not appear cluttered.

Certain input values for a transaction may be defined for storage into several data base fields. The system should not force the terminal operator to enter this single value more than once. Allowing assignment of one data base field to another is useful.

## Boolean Expressions

Most query systems allow the user to specify record occurrence selection through the use of Boolean expressions. Boolean expressions also have an application when updating is performed. They can be used to indicate constraints on acceptable input data.

An update request should be capable of indicating data validation criteria, whether failure of the criteria should result in an error or a warning condition and a message to be displayed to the terminal operator.

Extended query systems should be capable of generating audit trails and should be able to save both accepted and rejected transactions. The user should be able to query these audit trails and input them to other transactions.

An extended query system handles manipulation of data base records, fields within the records and relationships among the records. Particular fields for a record occurrence can have new values assigned to them; alternatively, numeric fields can be incremented or decremented by an input value.

The system performs conversions of input data to several formats. For example, numeric data is usually stored internally in packed or binary format. The system must handle conversion errors properly and must notify the terminal user when an error occurs. It should generally be possible to write a request that can place extensive amounts of "garbage" into a data base.

Retrieval is frequently an ad hoc activity. On the other hand, updating is usually an activity that is performed on a production basis.

With extended query systems, data bases can be created and modified rapidly, programmers can be more productive, data base designs can be realized almost immediately because the entire application does not need to be designed ahead of time and the application requirements can be tested on the computer without extensive programming. Entire application systems can be generated by the use of extended query languages.

Stadelmann is manager of language development at Mimer Systems, General Electric Information Services Co.

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# Integrated Information Management Systems

By Martin D. McKendrick  
Special to CW

Most organizations use information in three distinct ways. First, the traditional data processing center captures and produces operational information that is vital to the operation of the organization. Second, strategic information is necessary to manage the course of the enterprise. This must be concise in content and subject to impromptu demands. Third, personal data such as electronic mail, appointments and memos may be the highest level of information immediately available.

DP typically dictates to the user how and what the computer will provide, a procedure that has proven time-consuming, costly and ineffective. With the proliferation of personal computers, users who were once dependent on the DP department are acquiring computers independently. The need to integrate these powerful personal computers into corporate information systems will place demands on the DP organization that are far more challenging and complex than ever before.

Within most organizations, there exist mainframes, minis and micros from various manufacturers seeking to access common data bases. Personal computers must be able to access responsively and efficiently corporate data bases. Mainframes and their accompanying DP staffs must also retain control to monitor and ensure the integrity of these data bases.

A comprehensive system must have the ability to manage and disseminate responsively information from a common data base to various computers, regardless of manufacturer or operating system. Not only should the system support dissimilar computers, but it must ensure the integrity of the data base. Access must be controlled, and data traffic must be audited to ascertain the quality and flow of the data.

Sophisticated DBMS software is currently available for general-purpose computers. However, there are drawbacks to software-only implementations. Software-based DBMS often suffers from significant system overload and response degradation. In fact, if the DBMS is being run on a large mainframe, then the cost of the activities not being performed by the computer, in lieu of the DBMS program, can outweigh the value of the DBMS function.

A uniquely designed computer dedicated to performing DBMS can offer optimum performance while providing a cost-effective solution. Such a dedicated hardware and software solution is called a data base machine. This contains most of the DBMS software functionality on-

board the dedicated hardware. A small amount of programmed intelligence is required by the computers to coordinate command and query processing and to communicate with the data base machine. A data base machine allows any combination of host computers to access a common data base.

While speed of response is important, the response format is equally important. The advent of relational data base systems allows all users to access, update and review information in familiar formats of rows and columns. This format is fundamental to the way information is presented

in the business environment.

Once a system is developed and put into use, it is very difficult to incorporate major innovations. The tendency is to massage existing technologies. A comprehensive integrated information management solution must be thought through and designed to allow for next-generation technologies.

A well-designed integrated information management system allows the DP organization to continue performing the functions required by the mainframe, while the manipulation and transportation of data to the user is virtually transparent. Proper-

ly designed and integrated, such a system minimizes the necessity of programmer involvement and allows the user to perform work virtually independent of the DP organization. New solutions must easily coexist with existing DP system architectures.

The problem of managing the burgeoning level of corporate information in today's multiple computer environment is just beginning to dawn on management. Integrated information management teams must be developed internally.

McKendrick is product marketing manager at Britton-Lee, Inc.

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Small image showing a person using a computer terminal.

## Allows for More Work in Less Time

## Employee Benefits System Aids Administrators

STAMFORD, Conn. — Employees aren't the only ones benefiting from an employee benefits system developed at Combustion Engineering, Inc. (CE) here with the help of a data base management system (DBMS).

In the seven years since the system was created, the Fortune 500 company's corporate technical and nontechnical benefits administrators have been doing more work in less time, with a smaller staff and less assistance from the DP departments.

CE administers its own domestic pension, group insurance and em-

ployee investment plans for 34,000 active employees and over 6,400 retired salaried and hourly employees. The corporate employee benefits department handles all domestic benefits for the company, which supplies systems, equipment and services to oil and gas, petrochemical, utility and industrial markets worldwide.

Despite the complexity of such operations, nearly all benefits were maintained manually prior to 1975. It was the Employment Retirement Income Security Act — the government law mandating companies to

maintain accurate retirement and benefit plan records for employees, among other requirements — that led CE to automate fully its employee benefits records.

After some lengthy research, management realized in 1976 that few organizations had the capabilities to meet the needs of all CE benefits plans. CE began searching for a DBMS that was compatible with its IBM environment.

The software had to have the capabilities to handle corporate systems programs in order to meet all legal

reporting requirements, maintain records of employee retirement contributions, offer repeating fields for the 52 pay periods and allow the 100 domestic facilities to batch input and access their own data on-line in the decentralized environment, according to Robert Rupar, supervisor of benefits information systems.

Inquire from Infodata Systems, Inc. was installed early in 1977. "Prior to installing the employee benefits system, we were sending all benefits data to the remote locations, whose staffs would manually delete the names of terminated employees and fill in the names of new plan participants. After that information was collected, it was sent to the actuary for processing," Rupar said.

"Once a year the actuary sent us a booklet containing the retirement benefits information for each plan participant. The corporate employee benefits staff then manually calculated the retirement benefits for any individual retiring that year," he said.

## Frees Personnel for Other Duties

Today, all of CE's remote locations update the centralized benefits system in batch with basic employee data. CE's internal programs then calculate the yearly retirement benefits accruing for each employee. The corporate employee benefits department has been allowed to free three of its six benefits professionals for other duties.

The Inquire command-retrieval language also allows the staff to obtain statistical data to make decisions about designing future enhancements to its benefits plans, Rupar said.

CE also utilizes Inquire and its own internal program to do a monthly audit of retirement checks actually sent to pensioners from the trustee bank. The bank sends a tape of the checks issued to CE, which compares this against its benefits data base to reject any ineligible or unpaid payments. Soon after this monthly audit program was developed, an increase in the salaried pensioners was granted by management.

Even though this pension increase would be calculated for 2,700 people, Rupar saved intercompany billing and actuarial fees. Approximately 35 groups of set functions were entered through the on-line update as part of the Inquire replace-command query. The information was unloaded by Inquire to a tape and sent to the bank that makes the benefit payments for CE.

After the bank paid the checks, it sent its tape back to CE, where the monthly audit program was run. Rupar noticed fewer errors than those incurred when the company's actuary calculated the benefits.

Because CE does its own internal thrift-investment plan record keeping, remote personnel offices can retrieve a current statement of an employee's account. These locations also utilize Inquire's command language to format management reports to meet their own internal needs.

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# System Generator Produces Documentation

By Kim O. Jones

Special to CWA  
Successfully integrating a data base management system (DBMS) poses many problems:

- How to afford the time and expense of training current development personnel and hiring DBMS-experienced analysts and programmers
- How to enforce effectively standards with respect to accessing information stored on the data base.
- How to ensure adequate and accurate documentation for data base programs.

A system generator — a software

tool that automates tasks of designing and programming business applications — is one solution. It differs from application generators, fourth-generation languages and application development systems in that it is neither a pure code generator nor an interpretive development language. Major functions include the production of design and system documentation, in addition to the generation of a source language such as Cobol from the same input.

## Describing System Requirements

Initially, a system generator provides one with a nonprocedural lan-

guage with which to describe system requirements and detail specifications. The design documentation produced from one's input includes samples for reports and screens, file and data base layouts and data and processing flows and rules. In addition, the system generator produces data and component cross references, specification auditing diagnostics and project management status summaries.

The programmer, using the system generator's procedural commands, adds minor processing sub-routines to the specification input created by the analyst. All of the

source code is then generated by the system generator.

Very high-level nonprocedural and procedural commands are inherent in system generators. Control and search work area definitions are always created in the proper format. DBMS access calls are handled, entirely by automatically generated routines, and DBMS return codes are translated into meaningful and logical statuses.

## Creating User-Defined Commands

In addition to using the built-in DBMS commands, user-defined commands can be created by the data base administrator to simplify processing multiple-segment logical record sets. Using the command-definition features available with some system generators, a complex series of data base accesses (including work areas and procedural coding) can be invoked with a single command.

These capabilities allow the analyst and the programmer to approach the problem functionally, leaving almost all of the DBMS technical details to the system generator, which is acting literally as a catalog of DBMS experience.

A company using a system generator creates source code in which installation standards are the rule rather than the exception. This is accomplished through the use of high-level and user-defined commands, as well as user-modified system generator options.

Since 100% of the source code is generated from the system generator input, the resultant code is significantly dictated by the data base administrator and the department standards group, not by the analyst or programmer who created it. It becomes easier to cross standard code than nonstandard code. The standards that are enforced are controlled by the data base administrator, independent of application development.

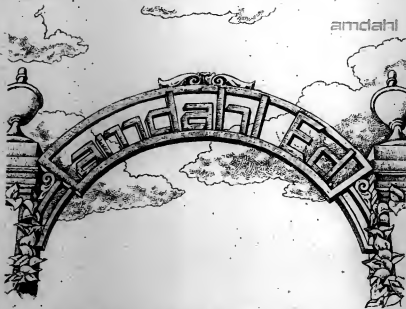
## Control of the DBMS Environment

Control of the DBMS environment is enhanced by the automated documentation produced by a system generator. Because the documentation is produced from the same input as the source programs, it always reflects the current status of all components in the data base application system.

Cross references are produced that identify segment and element use and access by program. Data base access volumes are extrapolated from transaction to system levels and are easily kept current.

During the production of each iteration of the system documentation, the system generator also performs extensive auditing of the input specifications, including checking for valid DBMS segment and element naming and ensuring that each program includes only allowable data base accesses. Any errors discovered are displayed in the specification diagnostic section of the design and system documentation.

Jones is president of Genavys Technologies, Inc. in San Francisco.



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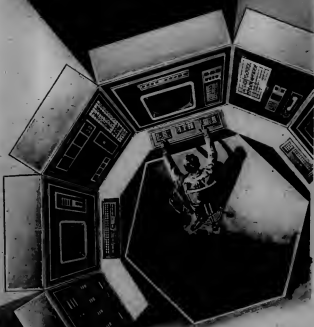
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# Utility Aid Gives Fuel Firm Breathing Space

**SALT LAKE CITY** — As a government-regulated utility, Mountain Fuel Supply Co., a major utility serving most of Utah, faces the problem of constantly having to change its reporting requirements. The data base group is continually inundated with requests from the data processing department to make changes to the data base.

So last summer the group began searching for an IBM IMS data base utility aid to solve its data base space usage problems. They found Databasic from Consumer Systems in Downers Grove, Ill.

Databasic is an IMS productivity

aid that automatically provides test data bases without coding. Built-in capabilities allow multiple users to create subsets of production data bases without affecting other users' test data and eliminate the need for multiple copies of data bases, according to the vendor. No system generations are required or existing environment changes needed, a spokesman said.

"We found ourselves always in a reactive, emergency situation," said Craig Dee, Mountain Fuel's supervisor of data administration. "Many times these requests had to be implemented immediately or Mountain

Fuel would face penalties. It was just not feasible for our data base group to handle and turn them around on a timely basis."

Mountain Fuel is also heavily involved in a large system development effort called the Wall Information System. The system contains 10 data bases that are intricately involved in many logical relationships, Dee said. The project is developed piece by piece by prototyping data bases and assigning teams of programmers to each prototype.

"As we bring a prototype data base up and integrate it with the other data bases, we assign resources to

work on that new prototype. If that prototype does not function properly, we cannot put it into the system and affect the logical relationships in all of the other data bases. Those other programmers have got to be able to continue testing."

Mountain Fuel had another problem in the use of its data bases. "Two of our company divisions, Transmission and Distribution, wanted to keep all of their segments and keys within the data bases separate from the other divisions so that there would be no mishaps or confusion between the two divisions' data," said Judy Kilby, systems programmer in charge of installation and maintenance of IMS and IMS software. "In essence, they each wanted their own separate data base. However, it was decided that all data bases should be kept at the corporate level."

Databasic allows Mountain Fuel to keep a corporate-level data base and yet makes it possible for each division to pull off particular segment types of data without affecting the integrity of each department's keys and segments in the corporate data base, Kilby said.

Dee explained the effect Databasic has had on compliance with government regulations. "Programmers were constantly at my door for new changes and requirements. Databasic has allowed us to stay ahead of user requirements," he said. "We can now present the solution to their problems faster than they can rewrite the programs. We can change a data base faster than application programmers can fix the code. We find ourselves in the position of waiting for the application people now."

For Mountain Fuel's Wall Information System, Databasic allows each programmer to have his own personal subset of the prototypes he is working on with the necessary logical relationships intact. If a new prototype is brought up for integration into the system and malfunctions, it will not affect any of the other programmers, their prototypes or logical relationships, Dee said.

"Databasic allows us to work on each new piece, and as each new piece is being developed, you get a test data base for it without influencing the work others are doing," he said. "We can work in an integrated mode in one area and a nonintegrated mode in another."

In the area of disk storage, the company went from four IBM 3380s to one 3580. The jobs take little time to set up, and system development projects proceed without any slowdown at the data base level, Kilby said.

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## Management System Helps College Track Student Info, Stay in Touch With Alumni

NORFOLK, Va. — Chartered in 1961 and opened in 1966, Virginia Wesleyan College (VWC) here relies on innovation rather than ivory-covered tradition to solve typical administrative problems. Tracking, classifying and scheduling students manually became unwieldy tasks as the school grew. Since these functions were handled by different administrative offices that required the same basic information, it was determined that a computer-aided management system was needed.

Recently, the administration installed Henco Software, Inc.'s Info data management system to handle applications in a number of administrative offices. The offices draw and update information from on-line data files to keep track of student records, maintain the college catalog, produce class lists and grade reports, maintain alumni files and produce mailings in addition to other uses.

"Info and [Marc Software International, Inc.'s] Muse word processing software were chosen because we don't have a large programming staff here at VWC. These packages are easy to implement, and laymen can be taught to use the system in a short time period," Dennis Govoni, director of computer services, said.

"The admission office is the starting place for information on prospective students," Govoni said. "Currently, this office maintains four basic data bases — the basic data, freshman, transfer and readmit files.

"The basic data file contains names and addresses of all individuals inquiring about admission to VWC. Each person applying for admission is classified, and that record is related to additional information contained in one of the other files."

### Main Biography File

The files set up by the admission office are used by other departments and offices throughout the campus. The registrar's office uses the basic file to obtain basic biographical information on an admitted student and to transfer it to his main biography file. This main biography file also contains the student's academic record.

Info's relational capabilities allow matching and sorting of student and course listings stored in Info data files, Govoni said. The system then generates a personalized course

schedule for each student, giving the course name and number, instructor's name, meeting place and time. Consistency with chosen programs of study is ensured by a check against a master curriculum file containing prerequisite courses. Other files used in the registrar's office contain college directory information, academic probation status and student standing with reference to proficiency examinations.

The registrar's office maintains a separate student biography file for each semester. A separate semester course offering file is related to the student biography file. "By keeping less frequently accessed information in separate files, processing times are kept to a minimum," Govoni said.

### Tracking Alumni

Info also helps the college keep in touch with alumni, according to Ray K. Patteson, vice-president for key resources. "We had a manual gift accounting system originally. We needed to have a highly efficient means of processing, coding and receiving gifts as the school grew," Patteson said. VWC purchased a Prime Computer, Inc. 550 supermini-computer and Info data management software for administrative improvement and strategic planning and management.

"The system is used to track about 15,000 contributions," Patteson said. Each group is assigned to a biographical file containing name, address and other data. These files also include pertinent data regarding gifts. "When a gift is sent to us, it is recorded in a gift file and assigned a unique transaction number and a pledge number for tracking by other programs," Patteson said. "If the gift is further specified as an installment pledge, future payments are recorded in a pledge/payment file. All pledges are summarized automatically in the gift file."

Once the biographical and financial data are recorded in the appropriate file, the college generates reports, including an alumni register, donor lists, special project reports, daily journals and transmittal forms for the business office.

The system is also used to produce the direct-mail solicitation letters using Muse word processing. Using Info, they are personalized automatically by accessing data in the biographical and gift files.



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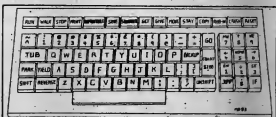
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## DBMS Restores Data Integrity

## Dairy Producer Avoids DP Disaster

SALT LAKE CITY — Sixteen months ago, Meadow Fresh Farms, Inc. was flirting with disaster. The multimillion dollar producer of dairy and dietary beverages was months behind in payments to its distributors, had no data integrity and could not make business forecasts. Data was stored separately in three minicomputers, and processing by clerks was well behind schedule.

Today, data is accurate, business forecasts are reliable, payments are current and Meadow Fresh Farms' relationships with its 100,000 distributors throughout the U.S. and Canada have improved greatly, according to Ron Zyzelewski, director of information systems. The company's corporate staff has been reduced from 130 to 39. Its data entry staff has been cut by 80%, its research and customer service staff by 96%.

The turning point occurred in June 1982 when the then one-year-old company formed a data processing department. In four months it designed and built a computer room, hired a DP staff and acquired hardware and software.

"We had been far behind in our payments and couldn't handle the data," Zyzelewski said. "It was taking almost a week just to print checks. For all practical purposes, our system was based on paper."

After selecting an IBM 4341-11 and an OS/MVS operating system, Meadow Fresh Farms began to evaluate data base management systems. Zyzelewski leaned heavily toward IBM's IMS DL/I, with which he had 11 years of experience.

A consultant hired by Meadow Fresh Farms said it would take a year to implement the IMS applications needed by the company. Applied Data Research, Inc. (ADR) assured Meadow Fresh Farms that its Datacom/DB software would accomplish the job in one-tenth the time required by IMS. The decision was made to go with ADR. In addition to Datacom/DB, Meadow Fresh Farms acquired ADR/DataDictionary, ADR/Dataquery, ADR/Datareporter, ADR/Librarian and ADR/Rococo.

Meadow Fresh Farms drastically cut corners on training. ADR established an ad hoc training schedule, with instruction limited to several hours per product, "just enough for us to get by," Zyzelewski said. Documentation manuals were used for follow-up instruction, he said.

Meadow Fresh Farms began to bring up its data base a few days after the initial training, but again had to cut corners. There wasn't time to test the system properly, conduct structured walk-throughs or use recommended methods to improve design. To compound its problems, Meadow Fresh Farms had to install ADR software, MVS and related applications and systems software all at the same time. The job was completed in a matter of days.

Meadow Fresh Farms immediately began to update its data and write its major applications. In one month, the company wrote 120 application

programs, both on-line and batch. Two months later, data that had been stored on the minicomputers was converted and current.

Today, Meadow Fresh Farms averages 250,000 transactions daily, processing purchase orders and distributor applications and performing accounting functions. Information is now immediately available on product mix, trends in purchasing and distributors' profiles.

The company views the results of Datacom/DB job executions through Roscoe and corrects and resubmits

large accounting reports before printing the output.

Dataquery has satisfied many ad hoc information requests from management. Inexperienced users have queried the data base after learning Dataquery by reading a manual, Zyzelewski noted.

Datareporter has enabled Meadow Fresh Farms' legal department to receive hard-copy reports on a one-time basis. Subsequent reports can be produced quickly with many changes in information content or format.



Ron Zyzelewski

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## Query Facility Eases Access to DBMS for Center

TULSA, Okla. — Standard Oil Co. of Indiana's Tulsa Data Center here needed an on-line query package that would allow users to satisfy their requests for information from data bases that did not have logical ties through the data center's existing data base management system (DBMS).

Though Tulsa Data Center's DBMS — IBM's IMS — may be many things, it is not normally considered user-friendly. However, using ASI/Inquiry from Applications Software, Inc. (ASI) of Torrance, Calif., the data center successfully provided users with an on-line query facility capable of accessing IMS data bases.

The Tulsa Data Center provides computing services for Amoco Production Co. Amoco Production's Exploration Department originally expressed a need for an on-line query facility capable of accessing IMS data bases in 1975. At that time, Standard Oil's Information Services Department was converting existing team applications to IMS. A study team was assigned the task of finding an on-line query package to meet the requirements as set forth by the Exploration Department. They included:

- A retrieval package oriented to non-DP personnel.
- Only incidental knowledge of data base structures required for use.
- Support for predefined commands or elements of complex queries.
- Security features.
- On-line documentation.
- Multiple path support within a data base in a single inquiry.
- Output that could be routed to a device other than the requesting terminal.
- Own-code exits for support of specialized inquiries.
- Interface with batch processing.
- Retrieval from multiple data bases in one inquiry.

### True Query Language

Of the four products studied in the evaluation, ASI/Inquiry from Applications Software, Inc. (ASI) of Torrance, Calif., was the only one that could be defined as a true query language, and it met 70% of the Exploration Department's requirements, according to Leslie Gayle, senior computer facilities analyst.

The product includes Sort/Defer logic; multiple data base and secondary index support; If logic; and arithmetic expressions to provide computed values and user-defined screen for-

mat. "The results of the pilot were that the software was fast and provided accurate answers," Gayle said. According to Gayle, the projected use was:

- To provide data base administration with an immediate solution for providing access to IMS data.
- To provide all Amoco

Production departments with interactive access to all corporate IMS data as it became available.

- To provide the system development area with access to test IMS data during program checkout and testing.

The product contained enough functions and flexi-

bility that each new IMS data base coming on-line was defined to ASI/Inquiry as a matter of course, and users were provided with immediate access to their data without having to wait for completion of a retrieval application, Gayle said.

"ASI/Inquiry became the primary access method of

IMS data bases. Message processing programs were written for only the most complex retrieval applications," she said. "Through ASI/Inquiry's multiple data base access facility, users were able to satisfy their requests for information from data bases which did not have logical ties through IMS."

# TIS WINS INDUSTRY'S HIGHEST TECHNOLOGY AWARD.

## Helps Keep Tabs On 8,000 Students

## College Masters Student-Body Data With CIS

ONTARIO — Although its products cannot be measured by the pound, bowed for shipment or displayed on shelves, Niagara College of Applied Arts and Technology's information needs are much like those of a commercial business.

Niagara College is one of the 22 community colleges in the Ontario Community College System. Since 1967, Niagara has offered a variety of programs to the local community of 350,000 residents, including full- and part-time career education, adult training and skill development programs.

Niagara's administrators need to know as much as possible about the hundreds of courses offered in a variety of disciplines. They also need to know about finances, course availability and class-

room occupancy.

But most importantly, the administrators need to know about the more than 8,000 full- and part-time students who enroll annually.

Niagara College's information manager is the College Information System

(CIS). Currently, the CIS comprises nearly 300 separate programs that manage registration information, student records, timetables, admissions documentation, staff-related data and course descriptions.

Designed by Niagara's in-house data processing staff, the CIS is based on the Seed data base management system (DBMS) offered by the Seed Software Operation of United Information Services, Inc.

## Dictionary-Run DBMS

Seed is a dictionary-run DBMS that includes data description and data manipulation languages, a query language, a report writer, a decision graphics option, a screen formatter and editor, an interactive data manipulation language and an intelligent file converter.

Louis Le Roux and Beth Weldon, manager and assistant manager, respectively, of Niagara's data processing department, said they faced a monumental challenge when they were asked to create the college's first totally integrated data base system.

"On a very slow day we process 500 transactions," Weldon explained. "Each transaction is defined as one change to a single record in the data base, and during the registration period we've processed as many as 18,000 transactions in one day."

Before CIS, the college had been using an antiquated batch processing system with less than desirable results. "The old registration system was constantly failing," Le Roux recalled. "Often, data changes would be delayed, information would be misplaced or a student's entire set of records might be lost."

"In February of 1982, an academic decision had already been made to change from a standard grade-point system to a percentage system. To do that on the old system would have required a major revision."

With their September deadline less than seven months away, Le Roux and Weldon began the design task. "In March, we spent long hours documenting enrollment procedures at the college," Weldon explained. "We wanted to find out as much as possible about the step-by-step procedures of the process."

From their research, Le Roux and Weldon wrote a three-volume recommendation.

(Continued on SR 48)



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# Some Tips for Purchasing a Relational DBMS

By Lee Elbinger  
Special to CW

Conventional wisdom among management information systems (MIS) professionals has it that data base management systems (DBMS) are "going relational." What are the implications of this transition, and what are the steps necessary to achieve it?

The primary advantage of any DBMS is that it provides data independence. The hierarchical and network models do provide some data independence, but by their nature they freeze the data into relations that limit its usefulness.

In contrast, the relational model provides a greater degree of data independence because no dependencies are defined at all; they are created by the user at execution time. All data is presented to the user in a tabular "user view" that is totally unrelated to the physical storage of the data; the relational software buffers the user from access considerations.

In addition to greater data independence, the relational data base concept provides set processing capabilities that allow the user to process whole tables of data at one time rather than one record at a time, as is done conventionally. The set processing capability is the consequence of a nonprocedural language, in which the user specifies the desired result and leaves it to the relational system to achieve that result.

However, one major obstacle to acceptance of the relational model is the unfamiliar terminology in which relational concepts are expressed. Another obstacle is that the performance of the DBMS, based on the relational model, is not yet comparable to the standards set by more familiar models. Third, there is the justifiable suspicion that the relational model is just a fad designed to complicate simple concepts and sell untested software.

The truth lies somewhere in between. Proponents of the relational DBMS model are correct in asserting

that their approach would provide a high degree of data independence, set processing capability and user freedom and provide ease of access. Opponents are equally correct when they charge that the relational concept is unnecessarily complex, untried and of dubious benefit. MIS managers are advised, therefore, to move cautiously into this area, and that is precisely what they are doing. More progressive MIS managers, however, are not content to adopt a "wait-and-see" attitude. If DBMS is truly going relational, such managers want to keep abreast of developments. Terence O'Neill, a consultant

with Applied Information Development, Inc. of Oak Brook, Ill., recommends seven steps for a user's first implementation of a relational DBMS [CW, Nov. 30, 1981]:

- A thorough requirements study should be done to determine the business need.
- The first application should be small and relatively self-contained.
- Data base design should be as complete as possible and include all of the systems that interface with the target applications.
- A modeling effort should be undertaken to determine the expected performance of the system.

- The vendor's software should be tested early in the project.
- Do not overstate the benefits of the implementation.
- Plan the project thoroughly and realistically.

Before applying these recommendations, one should read about the subject. In addition to published articles, the vendor's literature provides information about relational data base implementation. In most cases, vendors will provide reports, articles, brochures and user testimonials.

Elbinger is a systems analyst/programmer at the King Fahad Hospital in Riyadh, Saudi Arabia.

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(Continued from SR147)

tion proposed to the college. The recommendations included changes in policy and procedures that would be necessary to ensure that the new CIS would function smoothly. Because nearly every user's data processing knowledge was negligible, the data base system had to be user-friendly and easy to learn.

"None of our users had any experience with a terminal or an on-line system," Le Roux said. "But they understood the new system very quickly, partially, I think, because we stressed ease of use when we designed it."

The users adapted to the new system so readily that they never referred to the explanatory documentation written by Le Roux and Weldon.

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# Micro DBMS Keeps Trucking Firm Rolling

KAUFMAN, Texas — Barry Trucking Co. here no longer has to depend on time-sharing services for biweekly reports and invoices. The short-haul sand and gravel company has moved computer operations in-house.

Barry Trucking made the in-house move with a customized microcomputer data base application system, the Short-Haul Trucking System (STS), which was built by C&L Systems, a computer consulting/development application development firm located in Ennis, Texas.

STS is an information management system that performs accounting, billing and payroll functions. To deliver a fast, affordable system to Barry Trucking, the team at C&L Systems used as its development tool the Micro Data Base System (MDBS) from Micro Data Base Systems, Inc.

"One reason we first gave some thought to an in-house system was the show computer service we were getting for our money," Sharon Carrier, office manager at Barry Trucking, explained. The trucking company must account for 70 trucks, 500 delivery locations and a variety of products.

## Increased Productivity

Using MDBS, the developers at C&L Systems produced an on-line system that increased productivity dramatically, according to Barry Trucking officials. "We used to wait a week to get our invoices back from the computer service," Carrier said. "Now we process and mail them within two days."

Payroll is prepared in less than two hours instead of the eight hours formerly needed to write and post paychecks and to balance payroll accounts manually, she said. Quarterly, semiannual and annual reports required by the Internal Revenue Service, which took two weeks when done by hand, are generated by the STS in 10 minutes.

C&L Systems surveyed several software development products, including Ashton-Tate, Inc.'s dBase II. After C&L Systems Vice-President Richard Cook worked with it, however, he decided that a more flexible tool was needed. "With dBase II, I had to learn a whole new language. With MDBS, I was able to choose the language I felt most comfortable with," Cook said.

The STS consists of 16 major program modules, using PL/I/80 as the host language.

The system's MDBS schema consists of 14 record types involving 98 fields. They are related by means of 23 semantically distinct relationships integrated into a single data base without data redundancy. The STS runs under Digital Research, Inc.'s CP/M operating system.

The STS prepares sales analyses and invoices. It also manages payroll data, prints paychecks and generates 25 reports, according to Cook. The reports detail drivers' statistics, customer deliveries, mileage charges, product code assignments and other information.

All data is kept in a single data

base rather than a collection of files. For example, the STS retrieves from the sales analysis report the biweekly revenues of each truck and then deducts charges that have been entered for items such as fuel purchases and repairs to arrive at a net income figure for each trucker. Checks, along with itemized check stubs, are printed, Carrier said.

Data entry and creation are interactive, with set updating done overnight by the STS after business hours. The system enables Carrier, the sole operator of the STS, to enter transactions twice a month in a rapid input session. The STS uses the data

checking and editing capabilities of MDBS to ensure correct input of data automatically. Carrier estimated that she is able to enter 900 transaction tickets in five hours at an average of three per minute using a 10-key numeric key pad.

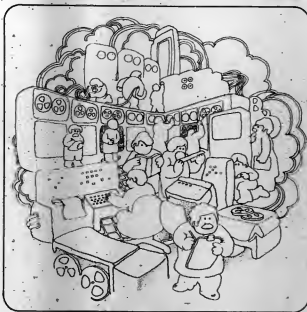
"At first, we only replaced the sales analysis and invoice preparation done by the time-sharing service with our own," Carrier said. "After seeing how well the system worked, though, we asked for more." Additional functions, including payroll, were added to the STS after installation. "With MDBS, customization or modification of a system is

done quickly, without a major reprogramming effort," Cook said.

The initial time and effort spent determining end-user needs and completing system design paid off, Cook said. The extended network data structure of MDBS enabled him to model the flow of operations at Barry Trucking and to develop a logical micro system for the company.

"MDBS allows a number of data relationships that we hadn't imagined were possible," Cook said. "Once system requirements are set, you just draw a picture. MDBS takes care of all sorting and maintains data relationships automatically."

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## Relationships Among Elements

## Managing Data for Electronic Systems Design

By Ashok Shenolikar

Special to CWJ

The electronic systems design process has been likened to structured software design. Because of the definite, inherent hierarchy, the process starts with initial high-level concepts. These

concepts form the basis of a more detailed design that defines the primitive elements.

Comparing this to a tree, the nodes of the branches represent how the primitive components are distributed and interconnected. The leaves on the branches spec-

ify the primitive cells of the design.

This design hierarchy may be depicted via alternative representations. For example, functional specifications, logic diagrams, block diagrams, interconnection diagrams, placement dia-

grams and behavioral specifications could represent different levels of the same design.

The principal reason for using a data base management system (DBMS) is to separate the activities of data organization and manage-

ment from the activities of generating applications using this data. Thus, the data is maintained independent of the application programs. The DBMS accomplishes this via an integrated set of general-purpose software programs.

However, the role of a data base manager is different for a computer-aided engineering (CAE) application than it is for a commercial business application. For business applications, users are in greater proximity to the DBMS environment than to CAE applications. Data base administrators and systems analysts spend a considerable amount of time in logical definition of the data and defining transactions and other application interfaces. For the CAE applications, most of the transactions and data access paths are already known. The data base merely works in the background accepting commands from the turnkey engineering applications software.

There is also a significant difference in the nature of transactions. For business applications, the queries are truly ad hoc, more frequent and require retrievals of small amounts of data from a data base. For engineering applications, the queries are generated at longer intervals and usually retrieve large amounts of data.

In a complete turnkey application, where an engineer is not required to perform traditional data administration functions, the use of a data base manager by a CAE vendor should not make a difference. But where interfaces to other systems, such as document processing, project management and manufacturing systems, are contemplated, the data base will offer invaluable flexibility. For complex, large-scale applications of these types, close attention should be paid to the data base architecture to ensure compatibility among the various applications.

Which data base architecture is better has no black-and-white answer. Much depends on the system configurations. The network and hierarchical data bases are finely tuned and have an established track record. But the processing overhead required to maintain these architectures generally requires a mainframe host.

Shenolikar is with the Government Support Systems Division of Harris Corp.



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# At Hartford Insurance Programmers Tie Agencies to Mainframe

By John Gallant

CW Staff

HARTFORD, Conn. — Drawing on an in-house project team of 45 programmers, the Hartford Insurance Group here has developed the Agency/Company Communications and Electronic Service System (Access), an interactive communications network that has given remote agencies access to the company's mainframe system.

According to William L. Harrison, vice-president of information management systems, Access enables independent agents in remote offices to access the Hartford's IBM 3081 mainframe through a dial-up telephone link from their own minicomputer systems or via a leased line network and a special terminal — called an "Exclusive" terminal — provided by the company.

Agents may choose between an on-line, batch or combination batch/on-line interface to the mainframe. This allows representatives to make inquiries and process

policy changes immediately for those with on-line capabilities and within 24 hours for batch subscribers.

Hartford, one of the nation's largest insurance companies, has already linked 250 independent agents to the corporate data

base via Access, and the company plans to have an additional 250 interfaced by the end of 1984. Harrison predicts that task will occupy the project team for at least another two years.

"The idea of linking remote agencies to the mainframe sprang up in 1980," Harrison said. "We envisioned Access as a sort of front end to take agency data in one format and convert it into a format for the mainframe system. Access is a series of programs designed to link company-developed computer systems with those systems in the different agencies."

"The Access software was developed entirely in-house," Harrison continued.

"We first put up our commercial and personal insurance lines, and then widened it to put all company functions, such as accounting/billing, claims handling and life insurance, on-line."

According to Harrison, the Access system is designed to recognize input from the remote minicomputers as agency data.

(Continued on Page 62)

## IBM Takes Wraps Off Three Products For Its CPU Users

WHITE PLAINS, N.Y. — IBM recently released three new products for its mainframe users. They include:

- A Customer Order Servicing (COS) Shipping Management module for its Communications-Oriented Production Information and Control System (COPICS) series of applications software.

- Release 4 of VS APL for VM/CMS, TSO or CICS users.

- The Language and Host Services (LHS) product to support the IBM 3650 and 3680 Programmable Store Systems (PSS).

Copies COS functions include assistance for end users in the tasks of order entry, servicing customer requests for delivery information, changing existing orders and maintaining order status, the company said. COS-Shipping Management extends the sequence of capabilities provided by IBM's COS-Data Management and COS-Order Management.

(Continued on Page 62)

## Pro-Source Unveils CICS Query And Report Writer

HOUSTON — Productive Resource Co. and Sonetics Corp. (Pro-Source) has announced Access+, an end-user-oriented IBM CICS query and report writer.

Information requests are entered free-form from any authorized CICS terminal, a Pro-Source spokesman said. Requests can be executed and displayed on-line under CICS in a pseudoconversational mode or submitted in batch. Files are defined in the Access+ dictionary by means of the on-line menu-driven maintenance system.

Existing Vsam, Isam and sequential access method files are read directly by Access+. An unlimited number of files can be read. Multiple users of the same file can be restricted to specific key ranges within a file, the spokesman noted.

Features include extended selection criteria, arithmetic capabilities, control breaks, totaling and selective display of named dictionary items. Screens or output reports can be formatted under Access+ control or be created free-form. The on-line maintenance system is used to designate security levels for Access+ users. Security can restrict user access to data by terminal, user identification, file and dictionary item.

Access+ is available for IBM DOS/VS, OS/VS and OS/VS1 operating systems with CICS/VS. A perpetual license costs \$16,000 for OS and \$14,000 for DOS until January 1. However, a significant price increase will be imposed effective January 1, the spokesman said from Suite 704, 1235 N. Loop West, Houston, Texas 77006.

## Data Base Service Targets Executives

COLUMBUS, Ohio — Compuserve, Inc. has announced an on-line data base and communications service for microcomputer users. Called Executive Information Service (EIS), it offers access from a variety of micros to a range of financial, news and research data bases and includes electronic conferencing and electronic mail, the company said.

Services include:

- Updates and selected price quotations on a continuous 20-minute delayed basis for over 9,000 security issues on the New York and American Stock Exchanges and the over the counter market.

- Standard & Poor's descriptive and financial information on more than 3,000 companies.

- Arnold Bernhard & Co.'s Value Line Data Base-II for performance analysis of more than 1,700 corporations.

- Caci, Inc. Federal's Site II/Site-Potential demographic data base.

- Electronic communications using Compuserve's Infoplex Electronic Mail

(Continued on Page 60)

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## 'Intellect' Available for DOS/VSE, MVS, VM

WHITE PLAINS, N.Y. — IBM last week formally announced the availability of Artificial Intelligence Corp.'s (AIC) Intellect natural language query system for IBM's DOS/VSE, MVS and VM operating systems. The release comes four months after the computer giant announced a marketing agreement with AIC to make Intellect a major new offering in its line of Information Center products (CW, June 20).

Intellect allows users to query files in ordinary English, using a flexible lexicon that can be updated and customized to unique environments, a spokesman said. The DOS/VSE version of Intellect includes an interface to IBM's Structured Query Language/Data System (SQL/DS) using

Interactive Computing and Control Facility (ICCF).

Under MVS/SP, Intellect queries Vsam files using TSO. The VM version queries Vsam files in the VM/SP environment using CMS. Both the MVS and VM versions can be expanded to provide an interface to IBM's Graphical Data Display Manager and Presentation Graphics Facility to produce a variety of charts and graphs.

Intellect's lexicon is comprised of a list of over 400 common English words and phrases applying to all data bases defined by the users. The lexicon can be further enhanced by defining synonyms, commonly occurring values in the data base, local jargon and groupings of data items.

Intellect on an IBM 30 series mainframe costs \$56,000 for DOS/VSE users and \$76,000 for MVS and VM users. The graphics interface for VM or

MVS costs \$16,500.

IBM's National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

## CRI Releases Version 1.10 Of 'Projectalert' for HP 3000

SANTA CLARA, Calif. — Computer Resources, Inc. (CRI) has announced the release of Version 1.10 of Projectalert, which the company described as an advanced project management system for Hewlett-Packard Co.'s HP 3000 computers utilizing the MPE operating system.

New capabilities include time-

scaled networks, which provide color or precedence diagrams showing the critical path and work accomplished against a user-selected time base. The menu-driven software is said to provide a system for planning, scheduling and monitoring all types of projects.

Projectalert Version 1.10 is also said to support a variety of HP plotters, including the HP 7580 and HP 7585 drafting plotters. The package can operate in conjunction with Version 4.30 of CRI's Relate/3000 integrated relational data base management system, providing the capability to integrate project planning and scheduling data with other data base information to create a decision support system, according to a vendor spokesman.

The basic system, including planning, scheduling and resource allocation, is priced at \$9,950 from CRI, 5333 Betsy Ross Drive, Santa Clara, Calif. 95054.

## 'EIS' Provides Data Base Service To Micro Users

(Continued from Page 59)

Service and the U.S. Postal Service's E-Com system.

• The Associated Press's Executive News Service.

• Electronic conferencing and professional forums.

• Updated schedule and fare information for commercial airline flights on the Official Airlines Guide Electronic Edition.

Compuserve's Professional Connection software for the IBM Personal Computer provides automatic dialing and sign-on, instant access to any area of the service, uploading and downloading of data, programmed function keys for menu selection and printer support, a spokesman said. However, EIS can be accessed by most computer terminals and communicating word processors.

Price is based on connect time and services used from Compuserve, Corporate Headquarters, 5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, Ohio 43220.

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## Aid Converts 'Mapics' Site To Multiuser Environment

NEEDHAM, Mass. — Marcam Data Systems Corp. has announced the Multiple Mapics Environment System (Mumes), which the firm described as a utility software package designed to convert an IBM System/38 single-user Manufacturing, Accounting and Production Information Control System (Mapics) environment to a multiuser environment.

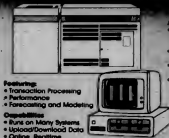
Mumes allows Mapics users to utilize multiple data bases on one CPU and maintain and utilize as many as 35 unique and independent data base entities from one CPU, a spokesman said. The package is said to create a multi-thread Mapics environment that allows data base entities with differing modifications or

specifications to be maintained and run concurrently on a single CPU.

The company said Mumes allows a single-threaded Mapics environment to keep System/38 workstation users on-line while running test, education or demonstration systems. Installation of entities or applications and security maintenance is menu-driven. The system also creates independent job queues for each entity installed in Mumes. It allows Mapics users to work in an interactive mode with any installed Mapics application and Marcam products.

Mumes is priced at \$1,900 from Marcam Data Systems, 123 Highland Ave., Needham, Mass. 02494.

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## Release 3.4 Of 'Screenform' Announced

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced Release 3.4 of Screenform, said to be an on-line tool for the interactive creation and maintenance of IBM TSO, CICS and IMS screen formats.

The Screenform package, which operates in the IBM OS/VS environment using 3270-type visual display terminals, now includes support for up to six terminals and three operators per screen format, and it can be used with either 80- or 132-col. terminals, according to a spokesman for the vendor.

An 80-col. terminal can be used to design formats for 132-col. devices. Because the new release requires users to specify an author name for each format, data base administrators can track and control screens, according to the spokesman.

Pricing for Release 3.4 of Screenform starts at \$12,500 from Boole & Babbage, World Headquarters, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

## Accounting Tool Targets HP Users

CHICAGO — An on-line, menu-driven accounts receivable system for Hewlett-Packard Co. HP 3000 series computers has been announced by Abacus Data Systems.

Excess is written in Cobol II and utilizes HP's Image data base management system and View to maximize its transaction processing capability. Batch jobs are said to be initiated interactively to validate input parameters, but are detached from the session to free the display terminal.

The package was designed for multiple company/location applications and provides an on-line inquiry subsystem to retrieve customer account information simultaneously, a spokesman said. Inquiry can be made by account number, name or Zip Code.

Purchase price is \$4,500 from Abacus Data Systems, 5000 W. Bloomingdale, Chicago, Ill. 60639.

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## Three IBM Products Debut for Mainframe Users

(Continued from Page 59)

COS-Shipping Management uses the order data generated in those application areas to control the processes of selecting customer orders for shipment; planning deliveries; picking materials from stock; packing orders; planning loads; and processing shipping results. The package is useful in manufacturing, process and

distribution companies and can be extended to cover intercompany orders, a spokesman said.

The product runs on an IBM System/370, 30 series or 4300 series processor supporting IBM's DL/I-DOS/VS or IMS/VS data base management systems in a CICS/VS environment. It requires 512K bytes of memory. The initial license charge is \$1,600, with a monthly charge of \$310.

The new release of VS APL allows users to access through the VS APL Graphical Data Display Manager (GDDM) processor the new functions that were provided with

GDDM Releases 2 and 3, the spokesman said. The user can access the Interactive Chart Utility of GDDM and a variety of other features. In addition, IBM said any new functions of future GDDM releases will automatically be available to users of the VS APL GDDM auxiliary processor. The basic license costs \$29, with a distributed support licensing option priced at \$246.

LHS is a replacement product for IBM's Subsystem Program Prep Support II (SPPS II) and PSS Host Support products that provides support previously available on both prod-

ucts, the spokesman said. It is said to improve the usability of 3650/3655 by reducing the number of tapes that must be installed and maintained.

LHS requires an IBM System/370, 4300 series or 30 series mainframe, under the DOS/VS, VSE/SP, OS/VS1 or OS/VS2 (MVS/370 and MVS/XA) operating systems and Vsam files. The initial license fee is \$4,000, with a monthly charge of \$415, the spokesman said.

IBM's National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

### TTI Enhances Sort Package For VAX-11s

ESCONDIDO, Calif. — Touch Technologies, Inc. (TTI) has introduced a major enhancement to TTI Sort, a high-performance sort package for Digital Equipment Corp. VAX-11-superminicomputers under the VMS operating system.

The package is implemented using a transparent interface between user applications and the VAX-11 Sort. This eliminates the need for any code changes, a spokesman said.

The package reportedly runs faster than the VAX-11 Sort, while also reducing disk space, direct and buffered I/O and page faults.

A perpetual license for the TTI Sort sells for \$1,295 for the first CPU and \$300 for each additional CPU from TTI at Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

## Hartford Develops 'Access' Interactive Net

(Continued from Page 59)

not in-house data, and the system processes that data only for the agency's use. No other agent has access to data from another remote office. In the interactive mode, he said, the agent's computer system acts like a terminal on the mainframe. The company supplies each agent with a modem, a telecommunications board to accommodate the linkup, and the Hartford-developed software package that renders the language of the agency's minicomputer compatible with the mainframe.

Harrison said Hartford faced two major problems in developing the Access system. First, in order for the system to function properly, the company had to negotiate with a va-

riety of vendors to arrange for necessary modifications of the agents' hardware.

"For example, we felt it would be better — and faster — if the agents had most of the editing capabilities at their end," Harrison said. "So, we had to negotiate with each of the vendors to get them to provide that capability."

The independent representatives operate a variety of minicomputer systems which the agents purchased to automate office functions. They include insurance industry-specific configurations based on hardware from Wang Laboratories, Inc., Digital Equipment Corp. and Honeywell, Inc.

Secondly, the existing in-house

system had to be modified for use by outside personnel. "We have had an interactive on-line system in use for quite some time," Harrison said. "But we had to make modifications to that system in order to provide the remote agents the same capabilities. In addition, the software had to be adapted to allow for batch processing, which is an option for the agents."

The Hartford programming staff employs IMS as its prime teleprocessing system, according to Harrison. In addition to the development aids the staff normally relies upon, programmers used Christensen Systems, Inc.'s Telen code generator to aid in screen development for the Access system.

## NOW ELECTROHOME HAS SIMPLIFIED

**Electrohome EDP 57 has achieved worldwide success in monochrome computer projection for training sessions, sales meetings, boardroom decisions and other group presentations.**

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## D&B Releases MV5/TSO Version Of Nomad2 Info Service

GOLETA, Calif. — Softool Corp. has announced that Softool, which the company described as a set of software tools for the management, development, maintenance and conversion of software, now runs on the Hewlett-Packard Co. HP 9000 desktop computers running HP-UX.

The vendor said the combination of Softool and HP-UX, the HP-supported version of Unix, will provide a complete, interactive software development and control facility. The Change and Configuration Control portion of Softool is said to allow software managers and programmers to keep track of software and documentation changes and versions. It also supports automatic reconstruction of previous versions, problem tracking, difference reports, management reports, access control and other functions.

Softool's Programming Environment portion is a collection of tools allowing a user to compose an application program from prefabricated code. The tools include shorthand language, source code auditor, interface documenter, code generator, testing aids and dynamic memory manager. Programming Environment is said to support Fortran, and an optional transportation package automates the conversion of Fortran programs from Digital Equipment Corp. and IBM to the HP 9000.

Softool is available with inter-

five tutorials for \$40,360 for a single CPU from Softool, 340 S. Kellogg Ave., Goleta, Calif. 93117.

## D&B Releases MV5/TSO Version Of Nomad2 Info Service

WILTON, Conn. — D&B Computing Services, the computer services company of Dun & Bradstreet Corp., has introduced an IBM MV5/TSO version of its Nomad2 information center service.

The new MV5/TSO version is offered as a part of the package, including a series of support staff and end-user training courses, supporting documentation and training aids.

The new information center contains the same product features

TALLAHASSEE, Fla. — ESI, Inc. has announced a package to link microcomputer software with data

bases on Burroughs Corp. mainframes without disturbing the integrity of production data bases.

Called Micropulse, the product was designed to use the Burroughs ET 2000 workstation in conjunction with any Burroughs B-1000 medium-size or large system. Micropulse allows users to extract selected data from the host data base and store it in their own personal data bases, the vendor said. The downloaded data is summarized and formatted for use by the software packages supported by ET 2000's Microsoft, Inc. MS-DOS 2.0 operating system. Control of data and host machine facilities is provided through sign-on data access security and resource utilization features.

Micropulse is composed of a component that resides on the Burroughs host and works with a component executing in the ET 2000, the spokesman said. A menu-driven, non-procedural interface is provided to build what the company called an "information data base" that is accessed by the end user. The user can extract information by data field and sort and aggregate the retrieved information for downloading. Data can be automatically formatted for certain microcomputer application programs.

The cost ranges from \$6,000 to \$25,000. Availability is scheduled for the first quarter of 1984 from ESI, 1801 S. Gadsden St., Tallahassee, Fla. 32301.

as the current VM/CMS version, including a data definition language, nonprocedural report writer, a statistical package and a complete financial modeling package, a spokesman said.

Available the first quarter of 1984, the product will be priced at \$135,000, including a financial modeling language and support staff training programs.

D&B Computing is located at 187 Danbury Road, Wilton, Conn. 06897.

## 'Business Modeler' Updated

OAK BROOK, Ill. — Business Model Systems, Inc. has announced a new version of its Business Modeler software system for use with IBM's System/34 and System/38 and NCR Corp. computers operating with CICS/VS under DOS/VSE.

Business Modeler is described as a business management and decision

support system, which is menu-driven and offers multiuser capabilities similar to those offered by systems with complex modeling languages.

Business Modeler is priced at \$18,500, and discounts are available for multiple-site licenses from Business Model Systems, 2625 W. Butterfield Road, Oak Brook, Ill. 60521.

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## 'Docuvis' Manages Insurance Rule, Rate Changes

DALLAS — Image Sciences, Inc. has announced Docuvis, a new independent component for the firm's Docuflex software package.

Docuvis is said to manage automatically the updating of rules and rate manuals for the insurance industry, and it can print a transmittal letter and revised pages of rules and rate manuals for distribution to manual hold-

ers. The Docuflex system is an automated document production and management package for use with IBM Models 4341 and up.

When rules or rates change, the user applies the changes to an electronic version of the manual residing in the Docuvis electronic library, and an approval request letter and revised pages are automatically printed, a spokesman said. A

status report is also printed indicating current status of the filing; approved, disapproved or pending. Docuvis is also said to print a report

stating the quantity, titles and destinations of all requests for replacement copies of entire manuals, sections or transmittals.

The base price for the Docuvis component is \$80,000 from Image Sciences, 8350 N. Central Expwy., Dallas, Texas 75206.

## Assembler Out for Intel Chips

COSTA MESA, Calif. — Systems and Software, Inc. has announced REX-SMA/86, a structured macro assembler for the Intel Corp.

80186/80187/80188 microprocessors, which is said to provide compatibility with Intel's ASM-86 relocatable macro cross-assembler and

offer program development hosted on the Digital Equipment Corp. VAX-11 series superminicomputers.

REX-SMA/86 is said to include a structured macro assembler that supports Intel's macro processing language and code macro facility; a locator that formats the object code modules into Intel MCS-86-compatible absolute code with optional debug information; and an object code librarian that provides library management for the object code modules. The package will run on any VAX in native mode under VMS.

Two optional absolute code converters are also included in the REX-SMA/86 that allow the absolute code to be converted into either Intel hexadecimal format or Tektronix, Inc. hexadecimal format. A user interface provides on-line help, and menu-driven input for constructing a command file is included to automate the linking and locating process.

REX-SMA/86 is priced starting at \$3,100 from Systems and Software, 3303 Harbor Blvd., C-11, Costa Mesa, Calif. 92626.

## 'Fast/Post' Unveiled By Walker

SAN FRANCISCO — Walker Interactive Products, Inc. has announced a financial subsystem for real-time journal entry and posting procedures with its Integrated, Interactive/General Ledger (II/GL) System.

Fast/Post reportedly permits multiple transaction posting entries from a single screen and can be user-tailored without programming to accommodate customized journal requirements.

It is available for 12-, 13- and 52-period accounting systems and handles both financial data and statistical data, a spokesman said.

Fast/Post will be distributed at no cost to all users of II/GL, which runs on IBM and plug-compatible mainframe computers for prices ranging from \$80,000. II/GL is part of Walker's Integrated, Interactive/Financial Systems, which range in price from \$67,500. Walker is located at 100 Mission St., San Francisco, Calif. 94105.

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## Program Generator Runs On Burroughs Machines

MINNEAPOLIS — Technalysis Corp. has introduced Generation II, an on-line program generator for Burroughs Corp. B-1700, B-1800 and B-1900 computers that allows programmers to create executable Cobol programs faster than hand coding.

Generation II is a new version of a program generator introduced two years ago by the vendor. Generation II can produce any type of on-line program, according to the vendor. It will access existing Burroughs DMS II data sets of conventional files, provide a choice of Cobol 68 or 74 and offer a variety of user options.

The program generator requires no special coding skills or extensive

training, a spokesman said. The programmer uses Generation II and designs all screen formats on the CRT screen, then specifies field edits and program parameters.

The one-time charge for the Generation II is \$10,000, which includes documentation and training material. The vendor is located at 6700 France Ave. S., Minneapolis, Minn. 55435.

## Security Tool Targets Users Of VAX-11

PROVO, Utah — Clyde Digital Systems, Inc. has introduced Contrl, an interactive security tool for Digital Equipment Corp.'s VAX-11 computers.

The software package was designed to monitor users without their knowledge, and it can also be used for user training and remote user support and instruction, according to the vendor.

Contrl allows a system manager or trainer to watch a new user run programs, correct mistakes and demonstrate procedures, the vendor said. In a time-sharing environment with remote users, the software allows on-site support, where a system manager can offer direct assistance to remote users.

The product is also available for DEC's RSTS/E operating system and is priced at \$900.

Further information is available from Clyde Digital Systems, Suite 3-E, 3707 N. Canyon Road, Provo, Utah 84604.

## Screen Manager Out for HP 3000

PHOENIX — EDP Construction Systems has announced the SCRN/3000 software package for users of the Hewlett-Packard Co. line of HP 3000 processors.

The company said SCRN/3000 is an on-line, interactive, character mode screen designing and management system. The package features build, modify, list, copy, test and delete capabilities in addition to an on-line directory of available screens. Upon completion of a screen design, the system utilizes a screen management subsystem to provide a simplified approach to program interface.

SCRN/3000 is said to utilize HP's Image data base management system and may be used with non-HP character mode terminals. It is available for \$995 from EDP Construction Systems, Suite 200, 2910 E. Camelback Road, Phoenix, Ariz. 85016.



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## 'Data Expediter' Backs IBM OS

LOS ANGELES — The Pacific International Marketing Co. has announced the Data Expediter for IBM mainframes running under OS.

## 'Caps-Invest' Manages Portfolios

ROSEMONT, Ill. — Capco Software, Inc. has introduced Caps-Invest, a Cobol-based product for use in managing a mixed investment portfolio.

Caps-Invest is geared toward the institutional investor. It features on-line processing of bonds, stocks, certificates of deposit and convertible investment information.

The major divisions of data include acquisitions, interest/dividend/principal/escrow, disposal, accumulation, amortization, market and book values.

The system can be run on Prime Computer, Inc., Burroughs Corp. or IBM computers.

Caps-Invest is available immediately at a price of \$25,000, which includes installation, user documentation and system documentation. Capco Software is located at 6300 N. River Road, Rosemont, Ill. 60018.

## Emulator Enhances IBM Micro

IRVINE, Calif. — Users of the IBM Personal Computer can communicate directly with IBM mainframes through an IBM 3270 terminal emulator add-on from AST Research, Inc.

The AST-PcoX terminal emulator allows IBM Personal Computer and Personal Computer XT systems to access IBM host systems as an IBM 3274/78 or 3278/79 terminal. An optional software package provides for menu-selected, bidirectional file transfers between the Personal Computer and the host system. In addition, the AST-PcoX emulator provides direct communication for 3270 series users with coaxial connections.

The AST-PcoX package is priced at \$1,195 and includes the Personal Computer board, user manual, emulation template and utility software diskette. An optional file transfer program, PcoX-ETU, costs \$200. More information is available from AST Research, which is located at 2121 Alton Ave., Irvine, Calif. 92714.

The package is described as a software tool that ensures the consistency of Cobol program data elements. It features the ability to find data names containing specified elements, check for users' standard naming conventions, and create a graphics display of a Cobol data definition. Data Expediter can be used to audit compliance with naming conventions and document Cobol source programs. It is

also said to eliminate redundant data names.

The software tool is said to work with all data dictionaries, and it can detect and report variations from user-identified naming standards. The Data Expediter produces comprehensive statistics at the end of each pass, recapping the report findings. It is priced at \$11,500 from Pacific International, Suite 400, 6033 W. Century Blvd., Los Angeles, Calif. 90045.

## 'Ezpers' for Wang VS Offers Human Resource Management

SEATTLE — Synergy Software, Inc. has announced Ezpers, a human resources management system for Wang Laboratories, Inc.'s VS computer.

The system provides a variety of reports, including standard reports required by various federal government agencies. Ezpers is written in Cobol with on-line documentation available from

any point in the system, the vendor said.

Ezpers is available as a stand-alone application or can be integrated with Synergy's Ezpay payroll system.

The price ranges from \$5,000 to \$25,000, with actual pricing dependent upon system configuration from Synergy Software, Suite 102, 1836 Westlake Ave. N., Seattle, Wash. 98109.

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## Maintenance Parts Manager Upgraded for Scheduling

ELMHURST, Ill. — Probe-III, a maintenance parts management system from Elfax Corp., reportedly has been upgraded to include work-order scheduling in addition to its existing modules of stockroom, tradesman, purchasing and inventory control.

The work-order scheduling module provides management reports, checks stock status when scheduling work orders and records equipment history and tradesman-time utilization, according to a vendor spokesman.

Supplementing the main module, which is inventory control, are sections dealing with stockroom, purchasing and tradesman, the vendor said.

The stockroom section automatically issues pick tickets for back orders when new stock is received and produces a back-order alert if still more stock is needed, according to a vendor spokesman.

The purchasing section analyzes and recalculates each inventory item's reorder point daily and issues suggested order reports, the vendor said.

The module for tradesmen is designed to help the user identify parts more easily, Elfax said.

Probe-III typically operates through a stand-alone minicomputer, with CRTs and printers located in the stockroom and shop area, the vendor said.

It can be used by any type of business with an inventory of 5,000 to 100,000 parts per location, the vendor said.

The existing Probe-III package costs \$300,000 with the new work-order module priced at \$200,000, according to the vendor.

## Hygiene, Safety Tool Debuts

ELK RIVER, Minn. — The Industrial Health and Hygiene Group, Inc. has introduced a medical, industrial, hygiene and safety system for the IBM System/38.

Called Biotrak, the product reportedly is an on-line, interactive system written in RPG III, which utilizes the System/38 data base capabilities and functions.

The Biotrak Medical Module was designed to enable close monitoring of individuals for physiological abnormalities in their early detection stages, according to a vendor spokesman.

The system compares the health of similar industry groups, points out trends and shifts in employee health and allows numerous ways to analyze the health and hygiene data available in the system, a spokesman said.

The Industrial Hygiene Module tracks employees who have been exposed to specific substances and their corresponding exposure levels, the vendor said.

The Safety Module evaluates patterns of high-accident rates, analyzes work relationships and tracks lost workdays and workers' compensation claims, according to a vendor spokesman.

The system sells for \$150,000, the

ing to the vendor.

The package is currently available to run on the Datapoint Corp. 6600 and larger systems, according to Elfax.

However, Elfax said it can custom convert the programs to run on any minicomputer system.

Elfax can be reached at 444 N. York Road, Elmhurst, Ill. 60126.

## Survey Tool Aids Engineers Using Wang VS

GLASTONBURY, Conn. — Modern Data Management, Inc. has announced Survey, an on-line data engineering system for users of Wang Laboratories, Inc.'s VS computer.

Survey is a problem-oriented programming system that enables civil engineers to solve coordinate geometry problems, the vendor said.

The prime feature of the system allows the engineer to state problems in a familiar terminology, such as azimuth, deflection and traverse adjustment, the vendor said.

The product can be applied to computation problems involved in control surveys, highway design, right-of-way surveys, interchange design, bridge geometry, subdivision work, land surveying and construction layout.

Survey is priced at \$3,000, according to the vendor.

Survey is available from Modern Data Management, located at 70 Oakwood Drive, Glastonbury, Conn. 06033.

## Hygiene, Safety Tool Debuts

vendor said.

The Industrial Health and Hygiene Group can be reached at 633 Upland Ave., P.O. Box 350, Elk River, Minn. 55330.

## Protocol Links Micros, CPUs

OAKLAND, Calif. — Wordcraft has announced the Christensen File Transfer Protocol for transferring files between mainframe and micro computers.

The protocol contains a block-structured algorithm and implementation notes to aid mainframe programming in Cobol, Fortran and other languages, a vendor spokesman said.

Some of the product's features include transfer of text, data, spreadsheets, object code and any files defined as a sequence of bytes. Used with data exchange formats like SDF or DIF, the protocol can, according to the vendor, download subsets of corporate data into personal computer spreadsheets and data bases.

The product is priced at \$395 and is available from Wordcraft at 3827 Penman Ave., Oakland, Calif. 94619.

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## Release 2.0 Available Of VAX Chargeback System

BRAINTREE, Mass. — Computer Information Systems of Massachusetts, Inc. has introduced several enhancements to VMSacctsys, the company's resource accounting and chargeback system for Digital Equipment Corp. VAX-11 processors running the VMS operating system.

VMSacctsys is a menu-driven, project-level accounting system that enables users to monitor usage of VAX systems and gather information about resource utilization, such as connect time, amount of disk use, amount of I/O activity, CPU time and related items, a vendor spokesman said.

Release 2.0 of VMSacctsys (former-

ly called React) permits installations to bill users by billing account, user name, user identification code, image use or any other installation-defined criteria.

New enhancements allow managers to track accounting information at the image level and to summarize information by project, by billing account and by any user-defined criteria, according to the spokesman for the vendor.

The price of the system is \$2,995. More information is available from Computer Information Systems of Massachusetts, which is located at 165 Bay State Drive, Braintree, Mass. 02184.

## For Displaywriter Program Checks Spelling

PORT CHESTER, N.Y. — IBM has introduced a Displaywriter licensed program that helps verify the spelling of 16,000 legal terms and an extended general usage dictionary that doubles the number of words that can be checked for spelling on the Displaywriter.

The Extended Spelling Dictionary-Legal is tailored to the needs of law firms and legal departments. The primary sources for the spelling and hyphenation of the terms in the program are Black's Law Dictionary, Fifth Edition, and Webster's Legal Speller, 1978.

The new program diskette, which is available for a one-time charge of \$195, is used in conjunction with

Textpack 6.

No Textpack 6 program diskettes with the spelling enhancement will be shipped automatically to licensed users.

Prices for the Textpack 6 licensed program with the extended dictionary remain the same. The one-time charge is \$1,150; the annual charge is \$520. The vendor is located at 900 King St., Port Chester, N.Y. 10573.

## Tegas-5 Simulates Nets For Engineers

SANTA CLARA, Calif. — Calma Co. has introduced Tegas-5, a time-based logic/fault simulation and test generation software package for printed-circuit board and integrated circuit-level design work.

The Tegas-5 simulator can run on a Data General Corp. MV/10000 and Digital Equipment Corp. VAX-11 series processor, as well as other superminicomputers, according to Calma. It enables an engineer to describe a network for simulation, verify that the logical implementation of a network is functionally correct and identify timing problems with the design. Other features of the system include worst-case analysis simulation, testability analysis, automatic test generation and fault simulation.

The Tegas-5 simulator costs \$135,000 including a DEC VAX 11/780 processor and is available from Calma at 2901 Tasman Drive, Santa Clara, Calif. 95050.

## Package Creates Form Files For HP's Vplus

AUSTIN, Texas — Cole & Van Sickle Co. has introduced Autoview, a package to create form files for Hewlett-Packard Co.'s Vplus forms handler from HP Image data bases.

Autoview is designed for use with the HP 3000 computer. It reads an image data base and creates a Vplus form for each data set in the data base. The programmer needs to specify only the name of an image data base.

The programmer can control the appearance of the forms by specifying field enhancements, field delimiters and other characteristics of the form, a spokesman said.

Autoview can be run interactively or in batch. The price is \$1,500 from Cole & Van Sickle, Suite 406, United Bank Tower, 400 W. 15th St., Austin, Texas 78701.



# DEFENDER II.

## The Next Generation Dial-Up Computer Access System.



## Compatible With Multiple PBXs Voicemail Mail System Introduced

SUNNYVALE, Calif. — Centigram Corp. has introduced a voice mail system design to facilitate internal and external communications.

Voicemail is a real-time electronic substitute for written memos or messages that would otherwise have to be dictated, typed or copied and physically distributed. It provides 24-hour-a-day, seven-day-a-week telephone access and allows for efficient communication across time zones.

Compatible with multiple private branch exchanges in the attached configuration, the system can plug into a company's existing digital switching equipment to answer telephone calls electronically and store and forward voice messages. Each user of Voicemail is given an electronic "mailbox" where messages are stored, according to a vendor spokesman.

The vendor's proprietary waveform coding technique, Crestcode, is said to combine a form of unique adaptive differential pulse code modulation algorithms for a method of encoding voice. Resulting digiti-

zation is at a data rate of 15K bit/sec, as compared with common rates of 24K bit/sec or higher. Because of the compression rate, less storage is required.

Voicemail's system allows users to send or receive voice messages using the telephone. The system is based on mnemonic commands that are keyed to function letters: "M" to make a message; "P" to play a message; "K" to keep a message; "D" to discard a message and "X" to exit the system, the spokesman said.

Five seconds of silence after a prompt will initiate another prompt, providing the user with a menu of options from which to choose.

Because it is an open system, outside callers, even those with rotary dialing, can access the system and leave messages in a specific mailbox. The company user can operate the system from any dual-tone, multifrequency telephone touch pad at home or while traveling.

The system reportedly features unlimited message length. Recording continues

until three seconds of silence is detected or until another command is entered. Pauses are automatically compressed out of the message to allow for more storage. Each message is time-stamped for reference. Messages are retrieved on a last-in, first-out basis, a vendor spokesman said.

Voicemail is available in three configurations. The VM 150, priced at \$28,000, supports

up to 200 users with 6.2 hours of message storage. Providing 9.8 hours of message storage capabilities, the VM 250 supports up to 300 users at a cost of \$37,000. The VM 400, supporting up to 500 users, provides 13.6 hours of storage at a price of \$49,500.

More information is available from Centigram at 1362 Borregas Ave., Sunnyvale, Calif. 94089.

## NBI Announces Options For Its Oasys 64 Series

BOULDER, Colo. — NBI, Inc., a manufacturer of high-performance office automation systems, has introduced two new communications products for its Oasys 64 series: Binary Synchronous Communications (BSC) 3270 capability and Digital Emulation Corp. VT100/VT52 emulation.

The Oasys 64, available in four different models, is a central controller that drives NBI's Oasys 3000 and Oasys 4000 series word processing workstations and Oasys 2000 personal computing workstations, as well as IBM Personal Computers.

The clustered products were designed to communicate interactively with IBM mainframe computers via BSC 3270 and emulate DEC's

VT100 or VT52 product series.

With the 3270 emulation, NBI customers can have a multifunctional workstation that may be used as a word processor or as a terminal to a mainframe computer, the vendor said. Some applications include data base inquiry, update, retrieval, document transmission and on-line program development.

The 3270 option is priced at \$3,000. The VT100/VT52 emulation option, priced at \$2,500, will be added to the vendor's asynchronous/BSC package. Both options will be available the first quarter of 1984. More information is available from NBI through P.O. Box 9001, Boulder, Colo. 80301.

## Communications System Touts Multifunctionality

RESEARCH TRIANGLE PARK, N.C. — Network Products, Inc. has introduced a modular communications system said to provide multifunctionality within a single unit.

Components reportedly reduces the communications systems to three basic building blocks — chassis, hardware modules and software modules — that can be used to implement switches, asynchronous and synchronous multiplexers, pads and entire networks communicating over ground lines, fiber optics, microwave and satellite.

Components hardware modules reportedly include a universal line card with four RS-232 ports, an asynchronous line card, a V-35 line card, a T1 line card, a channel interface card, switching/configuration, point-to-point multiplexing, multitrunk multiplexing and multitrunk multiplexing.

Range in price from \$2,200 to \$500,000, depending on the configuration, the system is available from Network Products at Research Triangle Park, N.C. 27709.

## Mux Combines 48 Voice, Data Lines

CHERRY HILL, N.J. — Data-tel, Inc., has introduced the DCP9100, a multiplexer said to reduce communication costs by combining up to 48 voice and data lines over a single T1 carrier facility.

T1 facilities offer 1.544M bit/sec of bandwidth. According to the vendor, the service is becoming more attractive in availability and price as microwave, satellite, infrared, fiber-optic and other private facilities have been added to telephone company offerings.

The DCP9100 accommodates up to 48 inputs, both voice and data. Data channels may be syn-

chronous or asynchronous, it speeds up to 596K bit/sec, a vendor spokesman said.

The DCP9100 includes test and monitoring capabilities as standard equipment. Built-in test pattern generators and detectors facilitate trouble-shooting without the need for external test equipment. System and individual channel testing may be performed from either end

of an installation.

Prices for the DCP9100 T1 multiplexer start at \$3,200 for the base unit. Each input channel costs \$325 per end. Delivery is 30 to 45 days.

Additional information is available from Data-tel, which is located at Pin Oak and Springdale Roads, Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

## Networking Facility Provides Communications to Prime Users

LA JOLLA, Calif. — A networking facility that provides asynchronous communications to a Prime Computer, Inc. system and any other remote interactive system is being offered by Pacer Software, Inc.

The package, called Gnet-II, enables a Prime user, either directly connected or dialed up, to communicate with any vendor's system that supports asynchronous terminals, according to Pacer. The communication

speed is limited only by the maximum rate of the line from the local to the remote system, the company added.

Gnet-II includes autodial support, auto-sign-on and auto-prompt.

The package, including documentation, installation guide and a 60-day warranty, is \$1,500. Sources are available for an additional \$1,000. Optional maintenance is \$150/year. Pacer Software is located at 1227 Pearl St., La Jolla, Calif. 92037.

## IBM Micro Enhancement Out

LOS ANGELES — C. Itoh Electronics, Inc. and Alternate Channel Marketing, Inc. have introduced the CIE-7850 IBM Personal Computer enhancement for use with existing IBM 3178 or 3278 terminals, as well as with the CIE-7800 multipersonality 3178/3278 plug-compatible terminal.

The CIE-7850 is said to be functionally compatible with

IBM Personal Computer versions, whether stand-alone or 3270-adapted, and will reportedly accept both Digital Research, Inc.'s CP/M and Microsoft Inc.'s MS-DOS operating systems.

Priced at \$2,495, the CIE-7850 will be available in late November from C. Itoh at 5301 Beethoven St., Los Angeles, Calif. 90066.

COMMUNICATIONS

# IBM 3270 Emulation Subsystems Fit Micros

LAGUNA HILLS, Calif. — IBM Computer Systems has announced the availability of an expandable family of

intelligent IBM 3270 emulation subsystems that plug into the IBM Personal Computer, XT and other compati-

ble computers.

Dubbed the PS-3270/BSC, the system, which uses IBM's PS-ICP Intelligent Communications Processor board and IBM-developed 3270 emulation software, relieves the communications load from the personal computer.

Depending on the hardware and software selected, the PS-3270 Intelligent Communications Subsystems em-

ulate the following IBM 3270 systems:

- Level one: Single station IBM 3276-2 control unit display station with attached 3287 printer.

- Level two: Small cluster system IBM 3276 control unit display station with 3287 printer and three down-line display stations for a cluster of four personal computers.

- Level three: Large cluster system IBM 3274-SIC

cluster controller with 3287 printer and 13 IBM Personal Computers emulating 3278-2 display stations.

The Level one subsystem is priced at \$1,295, with quantity discounts available. The Level two and Level three options are each priced at \$1,990.

More information is available from IBM at 23362 Persimmon Drive, Laguna Hills, Calif. 92653.

## Two Terminals Out For Executive Series

MELVILLE, N.Y. — Esprit Systems, Inc. has introduced two terminal products for its Executive terminal series.

The Executive 10/102 is a plug-for-plug replacement for the Digital Equipment Corp. VT102 and VT131 terminals. It offers a 14-in. tilt-and-swivel display with a 132 char./col. in a 5 by 9 dot-matrix format. It features a low-profile sculptured keyboard, meeting European DIN standards, and the same key layout found on DEC products, a vendor spokesman said.

The vendor also announced the Executive 10/25 terminal, with the same ergonomically designed package as the Executive 10/102. It features a 16-bit terminal processor, smooth scroll, 132 char./col. format and editing features.

Prices for the Executive 10/102 and the Executive 10/25 are \$995 and \$1,045, respectively. Delivery is 60 days. More information is

available from Esprit at 100 Marcus Drive, Melville, N.Y. 11747.

## Davox Adds Series Option To Controller

MERRIMACK, N.H. — Davox Communications Corp., a manufacturer of desktop workstations, has announced a high-speed communications option to the Davox Series 1000 cluster controller.

The enhanced controller results in transmission speeds of up to 56K bit/sec in IBM's Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) mode.

The Series 1000 controller is a microprocessor-controlled eight-port device. It is modularly expandable so that a fully configured Davox cluster can contain up to 56 devices, 32 terminals and/or printers, plus 24 IBM Personal Computers, the vendor said.

The 56K bit/sec communications option is priced at \$700. The base price for the Series 1000 controller, including both binary synchronous communications and SNA/SDLC emulators, is \$3,860. More information is available from Davox at 6 Continental Blvd., Merrimack, N.H. 03054.





## For High-Resolution Graphics

## Terminal Handles CAD/CAM

SANTA CLARA, Calif. — Ramtek Corp. has announced the 6411, a color graphics terminal for high-resolution applications, such as computer-aided design/computer-aided manufacturing.

The 6411 offers all the capabilities of the firm's top-of-the-line 6412 terminal, the vendor said.

In its basic configuration,

the 6411, with four refresh memory planes, allows simultaneous display (static or blinking) of 16 colors chosen from a palette of 4,096. Color selection is made from a programmable video lookup table, the vendor said.

With the addition of four optional planes of memory refresh, the 6411 can simultaneously display 256 colors from a palette of 16 million.

The 6411 has a display resolution of 1,280 by 1,024 pixels and a zoom ratio ranging from 1:1 to 16:1. The 6411 is based on a Zilog, Inc. Z80A microprocessor and comes with 12K bytes of random-access memory for user sub-routines.

The 6411 costs \$14,995. Ramtek said from 2211 Lawson Lane, Santa Clara, Calif. 95050.

Three Modems, Stat Mux  
Unveiled by Comdesign

GOLETA, Calif. — Three modems ranging in speed from 300 to 9,600 bit/sec and a statistical multiplexer that operates with both synchronous and asynchronous terminals have been introduced by Comdesign, Inc.

The Comdesign TM-1200 is a Bell 212A-compatible modem which operates full-duplex asynchronous at 300 bit/sec, or full-duplex syn-

chronous/asynchronous at 1,200 bit/sec over a two-wire dial-up circuit. The TM-1200 can be connected directly to the direct distance dialing network, the company noted. Automatic answer capability is also incorporated into the TM-1200.

The Comdesign TM-2400 data modem is Bell 201B-compatible and operates full-duplex synchronous at 2,400 bit/sec. The unit reportedly provides antistreaming protection to eliminate costly network jams. The digital interface complies with RS-232C and CCITT V.24 under CCITT Alternative B.

Comdesign's TM-9600 data modem is CCITT V.29-compatible and designed primarily for four-wire operation in point-to-point configurations. It operates at a speed of 9,600 bit/sec.

All three modems include testing features such as analog, digital, remote digital loopback and self-test, the vendor spokesman said.

The TC-500 statistical multiplexer concentrates both synchronous and asynchronous terminals and features programmable options. Using multiprocessor architecture, the TC-500 provides monitoring, statistics reporting and system diagnostics. Automatic error correction and optional dual data links are also provided.

The TC-500 also handles satellite communications by utilizing a programmable composite link delay. It is compatible with most host computers, Comdesign said, and is available in four- to 32-channel configurations. Prices range from \$1,700 for the four-channel version to \$7,800 for the 32-channel configuration.

Prices of the modems range from \$750 for the TM-1200 and TM-2400 to \$2,900 for the TM-9600. Additional information is available from Comdesign, which is located at 751 S. Kellogg Ave., Goleta, Calif. 93117.

# Only the Texas Instruments Professional Computer offers these 7 advantages that add up to more computer for your money.

If you're a smart business professional, you want a business computer that gives you the most productivity power for your dollar. For you, Texas Instruments has the answer: the TI Professional Computer. With seven, obvious advantages that make buying TI make sense.

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## Multipoint Mode Capability Kinex Modem Runs at 9,600 Bit/Sec

LARGO, Fla. — Kinex Corp. has developed a 9,600 bit/sec modem designed for network applications on domestic and international leased lines.

Designated the 9600/M, the modem reportedly can also operate in a multipoint mode in which up to four 2,400 bit/sec. data channels can use the same high-speed transmission path. Ten multipoint configurations utilizing varying port bit rates are selectable from the front panel.

Independently simulated controlled carrier operation, with different RTS-CTS delays, is provided for each port in the 9600/M. This enables connection of remote 2,400 and

4,800 bit/sec multipoint links to a central site through a multiplexed 9,600 bit/sec link, the company said.

The 9600/M data modem and the transmission link may be tested through internal test circuitry, and

loopbacks may be initiated from the front panel.

The price of the modem is \$3,650 with quantity discounts available from Kinex at 6950 Bryan Dairy Road, Largo, Fla. 33543.

## Videoconferencing System Debuts

SAN JOSE, Calif. — Compression Labs, Inc. has announced an international videoconferencing system said to enable global transmission of two-way, full-motion color video graphics and data.

Based on the vendor's Differential Transform Coding technology, the VTS 512 reportedly permits two-way

videoconferencing between sites throughout the world at speeds ranging from 512K bit/sec to 2.048M bit/sec.

Priced at \$145,000, the system will be available in the third quarter of 1984 from Compression Labs at 1800 Embarcadero Road, Palo Alto, Calif. 94303.

## 'I/O Express' Links Micros, Mainframes

FALLS CHURCH, Va. — Tau Systems Corp. has introduced its I/O Express software for microcomputers to provide user-interface and protocol conversion to remote stations and to allow global networking of various types of personal computers and mainframes.

Targeted for the office automation market, I/O Express is intended to simplify the installation of distributed workstation networks by using the telephone system or the office private branch exchange as the basic network architecture. The network may include up to 149 remote computer stations, according to a vendor spokesman.

The product was designed to allow an Open System Interconnection network by offering software protocol conversion for different protocols in common use. Micro-to-mainframe links are established using an adaptable line-at-a-time protocol, compatible with most mainframe time-sharing systems, the Tau spokesman reported.

Priced at \$395 per workstation, I/O Express is currently available under Digital Research, Inc.'s CP/M operating system. Additional information is available from Tau Systems, which is located at Suite 327, 7115 Leesburg Pike, Falls Church, Va. 22043.

## EIA Develops Data Standard For Serial Links

WASHINGTON, D.C. — The Engineering Department of the Electronic Industries Association (EIA) has developed a data communications standard for serial links between numerical control systems and equipment.

Called the RS-484, the standard was designed for moderate-speed communications between machine programs and data with numerical machine controls on a factory floor. The standard also has general-purpose capabilities that may be applied to data communications links that use asynchronous character transfer. For example, RS-484 can be used as an alternative to several proprietary protocols supported by computer vendors, according to a spokesman for the EIA.

The principal features of the RS-484 standard include two-way simultaneous message transfer, error detection and correction, and automatic retransmission, rejection of errors caused by noise, data transparency for character and binary data, a transparent link to application protocols, point-to-point applications, switched or nonswitched links, direct transmission or modem transmission and support for transmission speeds of up to 19.2K bit/sec, the spokesman said.

Copies of RS-484 are available for \$17 from the EIA's Standards Sales Department, which is located at 201 Eye St. N.W., Washington, D.C. 20006.

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## Compatible With IBM Micros

## Eagle Spirit XL Portable Unwrapped

LOS GATOS, Calif. — Eagle Computer, Inc. has unwrapped a hard disk-based transportable computer that is compatible with IBM's Personal Computer and Personal Computer XT.

Labeled the Eagle Spirit XL, the 16-bit system is compatible with both Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M 86 operating systems as well as with Microsoft's GW Basic programming language.

The system's basic configuration consists of the Intel Corp. 8088 microprocessor, 9-in. monochrome screen, 128K bytes of random-access memory expandable to 640K bytes on the motherboard, an integrated 10M-byte Winchester hard disk and a 5¼-in. floppy disk drive with 360K bytes of storage. Optionally available is the Intel 8087 support chip for mathematical applications.

A standard feature of the Personal Computer-compatible system is its color

graphics capabilities, allowing users to add an optional color monitor. A combined monochrome and color graphics display card with composite and red-green-blue output capable of simultaneous operation is also standard.

The Spirit XL weighs 33 lb and is car-

ried using a built-in handle. An optional carrying case is offered with shoulder strap, a spokesman said.

Expected to be available at the end of October, the Eagle Spirit XL is priced at \$4,795, from 983 University Ave., Los Gatos, Calif. 95030.

## TI Micro Gets Speech Package

DALLAS — Texas Instruments, Inc. has announced a speech recognition and synthesis turnkey application package for its Professional Computer.

The Speech Command application package reportedly can be integrated with any Microsoft, Inc. MS-DOS software program. It includes a plug-in hardware package said to accept voice commands and to allow the Professional Computer to deliver vocal feedback, the vendor said.

The transparent keyboard feature of the

software is said to allow verbal communication with the computer in addition to regular keyboard input. The system recognizes vocabularies of up to 50 words each. The number of vocabularies on the disk is only limited by the amount of mass storage on the system, a spokesman said.

Other features include connected word recognition capability and telephone management capabilities that reportedly allow the system to record incoming

(Continued on Page 76)

## Micros Bridge Gap to Firm's Supermini

CHICAGO — Harza Engineering Co. here is using microcomputers to link field engineers to the firm's superminicomputer.



Chicago's Tunnel and Reservoir Plan (below) and the Strontia Springs arch dam (above) are projects Harza Engineering Co. designed using a Harris Corp. 800 superminicomputer to alleviate the Chicago River and Lake Michigan overflow.

Harza is a consulting engineering firm operating in the development of water, land and energy resources. Its major emphasis is on water-related projects, from dam design to environmental studies.

Established in 1920, Harza is privately owned by about 20% of its approximately 800 employees. Harza currently has 160 projects under way in 20 countries; 125 projects are in the U.S.

"Our engineers need access to a powerful computer system. What good is it to give an engineer in the field one or two programs that'll work on a microcomputer when he needs to do an entire study and have access to our whole program library?" stated Kenneth J. Reza, head of computer services at Harza.

## Too Large for Micros

That is why Harza is going with terminals at engineering sites that can communicate directly with its superminicomputer. Most of Harza's programs are too large for micros, although the firm may try using them for off-line storage, connecting up on the phone line and dumping data to save communications costs. But for true access, especially if the project requires a lot of different programs, having phone lines with direct connect is the only way, Reza said.

Harza took its first major step in imple-

menting terminals at remote job sites when it installed CRTs at a hydroelectric project on Alaska's Susitna River. "We're thinking of at least one dedicated line up there, one dedicated 9,600-baud line multiplexed with a minimum of four terminals, another dedicated line from Bellevue, Wash., [a project office] to Chicago and possibly to New York and Washington, D.C.," Reza explained.

Harza has been utilizing computers for approximately 25 years. Prior to installing its superminicomputer nearly three years ago, Harza had been working with service bureaus at a cost averaging about \$40,000 a month.

"We evaluated a number of superminis, and it came down to [Harris Corp.] and Digital Equipment Corp. In our benchmark, the Harris 500 came out equivalent to the DEC VAX-11/780, and the Harris 800 was 50% faster. Compared to the [Sperry Corp.] 1108s we were used to running on at the service bureau, the Harris 800 was 33% faster. The dollar figures were factors, too. It turned out we would be getting more value for the money with the 800," Reza said.

## Interactive Operating System

Another big selling point for the Harris machine was its interactive operating system, which was extremely user-friendly. In addition, the disk storage was considerable compared to the Sperry, which could only access two million words of disk storage, Reza added.


"The full Harris 800 configuration, including overhead, runs at about half the \$40,000-per-month cost of the service bureau," Reza said.

Harza's computer usage since installing the H800 has increased almost fivefold both from applications and users' standpoints. "Coming from service bureaus, we had some knowledge of communications. When the Harris came in, we put about 30 terminals all over the building, using differential and interbuilding phone lines. We were able to communicate up to 19.2 baud," Reza said.

Harza's H800 has 2.5M bytes of real memory and up to 10M bytes of virtual memory. Peripheral devices include a 675M-byte and two 80M-byte disk drives; an 800/1,600 byte/in. magnetic tape drive;

(Continued on Page 78)

SYSTEMS & PERIPHERALS



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Wordplex Corp. Portable PC

## Wordplex Desktop, Portable Run Software for IBM Micro

WESTLAKE VILLAGE, Calif. — Wordplex Corp. has unveiled desktop and portable computers that run most software packages designed for IBM's Personal Computer.

The Wordplex Desktop PC and

Portable PC both use Intel Corp.'s 8088 microprocessor and are compatible with Microsoft's Inc.'s MS-DOS operating system. Both systems also accept four IBM Personal Computer-compatible board upgrades, according to the company.

The main board in both systems contains 128K bytes of random-access memory and can be expanded to 512K bytes. A 320K-byte double-sided floppy and 10M-byte Winchester drive are available as options. The main board also includes communication and printer ports.

The units' video monitors display high-resolution characters and graphics, high-contrast image and nonpareil, nonreflective, 9-in. screens. Text and graphics can be displayed at the same time, the company said.

To be marketed as an executive workstation, both systems are compatible with application software such as VisiCorp's VisiSeries line and Ashton-Tate's dBase II.

Price of the monitorless Desktop PC with a single floppy disk is \$2,696. A monitor can be added for an additional \$287. The single-floppy version of the Portable PC costs \$2,926, the vendor said from 141 Triunfo Canyon Road, Westlake Village, Calif. 91361.

## Speech Package Out for TI Micro

(Continued from Page 75)

phone messages, dial telephone numbers, deliver outgoing phone messages and provide playback of recorded messages that can be activated from a remote telephone.

The Speech Command package includes two piggyback circuit boards, a headset, user's manual and two software diskettes, an installation/ diagnostics guide, diagnostics diskette and a telephone cable.

The complete kit is priced at \$2,600 and is scheduled for shipment in November, the spokesman said. More information is available from TI through P.O. Box 402340, H-678, Dallas, Texas 75240.

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## INFOEXTEND PRODUCTS

Infoextend Products are made by Information Magnetics Corp., Inc. A subsidiary of ICC.

FORT LAUDERDALE, Fla. — Gould, Inc.'s Computer Systems Division has announced two modular performance enhancements for the firm's Concept/32 line of 32-bit superminicomputers. The enhancements are an updated release of the firm's Fortran 77+ compiler and a new Multiply Accelerator for the Concept 32/8780.

Using a Whetstone I benchmark, Gould said the combined use of the Fortran 77+ compiler and Multiply Accelerator can potentially boost program execution by 55%.

The Fortran 77+ compiler has been optimized to improve program execution speed. Gould said the enhanced compiler offers a 27% improvement in performance on the Concept/8780, the vendor said.

The Fortran 77+ compiler and associated Scientific Run-Time Library comply with most popular standards. The compiler costs \$4,500, the vendor said.

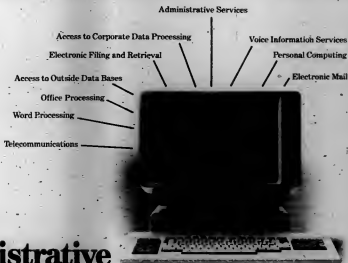
The Multiply Accelerator consists of two printed-circuit modules that plug into the firm's Selbus in the Concept 32/87 chassis. Since it is a modular enhancement, the Multiply Accelerator can be field-installed on an existing system or it can be included in a new system.

The Multiply Accelerator computes products for nine fixed- and floating-point instructions in the Concept 32/8780. Except for an improvement in execution speed, the device is transparent to systems software, the vendor said.

The Multiply Accelerator costs \$25,000 from Gould through 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

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# Field Engineers Tied to Supermini via Micros

(Continued from Page 75)  
a California Computer Products, Inc. 1051 drum plotter; one 600 card/min. finite element analysis; two 600 line/min. printers; a Versatec, Inc. line/min. printer/plotter; a Tektronix, Inc. 4014 terminal; hard-copy unit and 11-in. digitizer; a 36-in. Calcomp digitizer; seven Anderson, Inc. models; Inc. 520 CRTs with Anderson Jacobson 833 printers for word processing; 17 Harris 8680 interactive CRTs; and five 301/1,200-baud autogunners Bell Laboratories modems and Hesp host with an 4,800-baud dial-I/O, Bell modem.

Graphics has been one of the major growth areas at Harza since it installed the Harris 800. Harza has been training personnel in Harza's CAD using a three-dimensional package. Harza is also converting the Relational Information Manager, a data base management system developed by the National Aeronautics and Space Administration, for Harris computers. "We've been deluged with requests for it from other Harza users," Reza commented. "Along with the data base, word processing via Harris Mue is starting to go over big with our secretarial staff."

The lion's share of computer usage at Harza involves programs for analysis, simulation and design—approximately 80%. About 10% is for data base management, 7% for word processing and 3% for CAD drafting. It is expected that the latter will show dramatic growth in usage very soon.

"Obviously, we use the computer for the design and drafting stages—everything from finite element analysis studies on different structures to computing concrete quantities and reinforcement bars needed computer-aided drafting for the actual drawings and modifications," Reza said.

## Analysis Program

One program Harza uses extensively is the Structural Analysis Program (SAP). This is a general-purpose, finite element program that can model any complex structure mathematically. It analyzes structures for static and dynamic loads. SAP also can be used to generate the predicted deflections of an arch dam under earthquake effects on the dam.

"We also use the computer for project management. We use an in-house developed, extensively modified and improved version of Digital Research, Inc.'s CP/M Pert-type analysis. CP/M includes all the nodes and elements of a project, isolates the critical ones and computes the effect on the entire project if they were stopped, slowed down or extended. Pert does the algorithm, the statistical probabilities," Reza added.

Most of Harza's programs are in Fortran. However, the administrative tasks that are handled by the service bureau are in Cobol. Harza decided to keep some of its administrative work at the service bureau for the time being to avoid burdening the Harris 800 with the I/O requirements of the smaller administrative programs.

Engineers are given as much computer access as they want for their engineering work. Priorities are changed for them, and they cater to projects with tight deadlines. In the future, Harza is considering installation of a second Harris 800 and bringing its accounting work in-house.

"The Harris 800 is used almost entirely for interactive work by the engineers and designers. There are batch runs," Reza explained, "getting the data to a control point once the data preparation is done. But that's really a form of interactivity, too. While that job is running, an engineer can be reviewing his data for modifications, corrections or deciding his next step."

"There aren't too many problems in the world where he just enters the data and the computer shoots out the entire answer. If that was the case, we wouldn't need engineers or designers," he added.

Besides the Harris 800 supermini computer system, Harza also has two other Harris systems, a Harris remote job entry terminal and a Harris 9200 with three CRTs and a 600 line/min printer.

The Harris 1620 telecommunications workstation has a 64K-byte CPU, two 600 line/min printers, a 100 card/min punch and dual emulation. Its primary function is to communicate with the service bureau where administrative work is performed. All three systems are equipped with bi-synchronous communications adapters that allow access to service bureaus, clients and government agencies.

Harza has compiled an extensive program library that comprises approximately 400 major technical programs and about 150 administrative programs. Although some of these programs have been acquired from outside sources, 80% of them have been developed by Harza.

These computer programs can be classified into three basic categories: analytical, simulation and optimization. Analytical programs are used for problems in engineering design and analysis. This could include structural design, soil mechanics and hydrodynamics.

Simulation programs are used for studying and evaluating the operation of a project. This type of program could be used in areas such as reservoir operation for flood control, hydro power production, low flow augmentation or electric power systems operation.

The optimization programs are mathematical programming algorithms, such as linear programming, to determine the best solution to a problem. An example is the minimum cost design or operation of a project to meet a specified level of output. Often, optimization of a complex system is achieved through successive simulations.

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# Firm Unveils Enhanced Controller, CPU Board

COSTA MESA, Calif. — Star Technologies, Inc. has introduced two products it claims will increase the performance of its entire line of combined data and word processing minicomputers and microcomputers. The company designs, manufactures, markets and services data and word processing mini and microcomputers for the office automation market, according to a spokesman.

The first product is an improved version of the company's proprietary multifunction Dart controller. Super

Dart increases disk transfers by over 35% and multiuser station capacity from five to nine. It also allows for the use of all sizes of Winchester drives.

The second product is a CPU/memory board that increases available memory from 128K bytes to 512K bytes. Using mapped memory techniques, the CPU allows faster response to a larger number of simultaneous users, the vendor spokesman said.

The price of the Super-Dart is

\$1,280; the 512K-byte memory board is \$3,840. Both enhancements were designed for the Micro Star, the Mini Star 200 and the Mini Star 400, priced

from \$11,000.

More information is available from Star Technologies at 3180 Pullman, Costa Mesa, Calif. 92626.

## Burroughs Offers On-Line Service

DETROIT — Burroughs Corp. has introduced a computerized marketing service that allows customers to make telephone orders and, in many cases, get delivery within 24 hours.

The Burroughs On-Line Supplies Service (Boss) is available by calling a

toll-free 800 number. Products available include an array of computer products and office supplies, such as ribbons, print wheels, computer disks and paper.

The Boss toll-free number is (800) 448-1424.

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## Teleram Takes Wraps Off Portable Office System

WHITE PLAINS, N.Y. — Teleram Communications Corp. has introduced a combined portable desktop office system comprised of the Model 3000-1 portable computer and the Model 3500-desktop office station. The system is priced at \$3,495.

The package includes the office interface console, plus a floppy disk interface card and a CRT monitor interface card, as well as one half-high floppy disk drive and all the necessary cabling. A CRT monitor may be purchased separately for an additional \$195.

The portable 3000-1 weighs less

than 9 lb and fits into a briefcase, the company said. It is a full-function computer with a full-size keyboard and up to 256K bytes of nonvolatile bubble memory.

The 3500 office station reportedly can serve as a home base for several Teleram portable computers. Programs can be loaded and unloaded, and copy can be transferred from a portable's bubble memory for more permanent storage while the 3500 charges the portable's internal battery.

More information is available from Teleram at Two Corporate Drive, White Plains, N.Y. 10604.

## From Monolithic Systems

## Micro Boasts Multitasking

ENGLEWOOD, Colo. — Monolithic Systems Corp. has announced a portable computer designed for multitasking applications.

The Indy Industrial Portable Computer, first in a planned family of system and support products, offers two operating systems, four high-level languages and a variety of utility programs.

Based on the Intel Corp. Multibus architecture, the Indy Portable Computer integrates a 16-bit 80186 CPU, up to 512K bytes of parity random-access memory (RAM), 9-in. CRT screen, dual 3½-in. floppy disk drives, parallel and serial ports and SCSI interface. The total package weighs approximately 35 lb and in-

cludes a 100W power supply, cooling fans and a built-in carrying handle.

According to a vendor spokesman, the customer may choose between Intel's iRMX-86 operating system and Digital Research, Inc.'s Concurrent CP/M 86. Monolithic Systems has implemented the two software systems so that applications and utilities supplied by the vendor operate identically from the user's point of view.

iRMX-86 is a multiuser, multitasking, real-time operating system which provides such advanced features as hierarchical file structures with variable file granularity. It schedules tasks with true real-time preemptive priorities. It enables dynamic memory allocation among concurrent applications with device-independent I/O.

Concurrent CP/M 86 is a single-user, multitasking system that executes up to four tasks concurrently. Its virtual console approach allows the CRT terminal to act as a window into any one of the tasks. Its file structure is compatible with that of the familiar CP/M 80 system.

Four language compilers are available: Fortran, Pascal, Basic and C (Version 7). Basic is also available in interpretive form. Other software modules in the comprehensive package include a full-screen CRT editor, assembler/linker, formatter for both Winchester and floppy disk drives, hardware diagnostics and a programable read-only memory.

The Indy Portable Computer is available in a variety of configurations, starting as a portable terminal containing only the CRT controller board at a single-unit price of \$1,975.

A packaged system with the CP/M 86 operating system and 128K bytes of RAM is priced at \$4,875, while the same configuration with the iRMX-86 operating system has a price of \$5,475.

All models will be available in production quantities the first quarter of 1984. The vendor will have a limited number of evaluation units available with 512K bytes of on-board RAM, based on 256K-byte RAM chips at a price of \$1,975.

More information is available from Monolithic Systems at 84 Inverness Circle E., Englewood, Colo. 80112.

## CDC Expands Maintenance

MINNEAPOLIS — Control Data Corp. has announced the expansion of its Comma maintenance services to include the IBM 4331 and 4341 processors.

The expansion reportedly enables the vendor to provide maintenance services as well as installation and relocation services for the entire 4300 product line.

The price of Comma maintenance services, which varies according to the type of equipment and frequency of service, ranges from \$330 to \$1,075.

More information is available from CDC through P.O. Box 0, Minneapolis, Minn. 55440.

## Braegen's Way Puts IBM-Compatible Personal Computing Inside A Low-Cost, 3274-Compatible Cluster Controller.

Several companies now offer personal computing capability as part of their 3270 terminal package. Their approach, however, has built-in problems—primarily because the personal computing isn't built in, but just bolted on.

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And you can upgrade from 128 to 640 Kb of RAM—or integrate a 10-Mb

Winchester drive for optimum multi-user response and security.

**More Control And Economy.** Undoubtedly, it is the control you gain and the dollars you save that really distinguish the 8430. Because the PC capability is integrated into the controller, the DP Manager gets data security while the user gets economical access to a communications network.

As for economy, consider first the 8430 is more cost-effective when used just as a 3274 controller alternative. Add the multi-user PC capability and you can save thousands of dollars—and a lot of space—in equipment alone.

There's no investment in additional software for each workstation, or in additional communications lines. Expensive resources—such as letter-quality printers and Winchester drives—can be shared. And a unique remote-maintenance feature that lets our Field Engineers dial up and diagnose the 8430 from any location reduces downtime costs.

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## For IBM Personal Computer

## Firm Unleashes Peripherals

BEDFORD, Mass. — Ideassociates, Inc., a manufacturer of peripherals for the IBM Personal Computer, has unveiled a raft of products, including a monochrome/color display, graphics card, a graphics card for general-purpose applications, reportedly features high- and medium-resolution graphics in combination with a monochrome/color display. A display memory of 128K to 256K bytes, programmable to eight planes and up to 256 colors selectable from a palette of 4,096, will be available soon, the vendor said. Ideagraphics ranges in price from \$895 to \$1,895.

The IDE line of disk products has been expanded to include 10M-, 20M- and 40M bytes of 3.9-in. Winchester disk storage, available in fixed or removable, internal or external mount versions. Prices range from \$1,495 to \$5,295, depending upon configuration, a spokeswoman said.

Further integration of the disk line will be achieved through the introduction of two resource-sharing products: Ideashare and Ideanet. Ideashare, a software product designed for small business applications, allows asynchronous communications for disk sharing by up to four users. It costs \$595. Ideanet, designed for larger scale networking, is said to be a turnkey product that provides high-speed coaxial communications within a range of 2,000 feet. It is 100% compatible with Orchid Technology, Inc.'s PC Net and costs \$595 for the board and \$795 for the software, a spokeswoman said.

Also introduced was Ideacomm 3278, a high-speed mainframe communications card. It allows IBM Personal Computers to interface with the IBM 3274 and/or IBM 3276, whether local or remote, using IBM's Binary Synchronous Communications or Synchronous Data Link Control. Ideacomm 3278 costs \$1,195. Ideassociates is located at 7 Oak Park Drive, Bedford, Mass. 01730.

Also introduced was Ideacomm 3278, a high-speed mainframe communications card. It allows IBM Personal Computers to interface with the IBM 3274 and/or IBM 3276, whether local or remote, using IBM's Binary Synchronous Communications or Synchronous Data Link Control. Ideacomm 3278 costs \$1,195. Ideassociates is located at 7 Oak Park Drive, Bedford, Mass. 01730.

## Apple Unveils Business System, Serial Card III

CUPERTINO, Calif. — Apple Computer, Inc. has introduced the Apple III Business System, which is said to provide both hardware and system software components for small- to medium-size businesses. Also introduced was the Apple Serial Card III for Apple III users requiring more than one serial communications device. With appropriate software, the card reportedly enables users to perform multiple communications tasks. Suggested retail price is \$225.

The Apple III Business System includes:

- The Apple III personal computer with 256K bytes of memory and a built-in floppy disk drive.
- Profile — Apple's 32M-byte hard disk.

- Monitor III — a 12-in. monitor.
- Catalyst 2.0 Program Selection software from Quark, Inc., which enables users to select and switch programs resident in the hard disk without resetting the system.

System Utilities Product Training Pak, which includes instructions, reference cards and a self-help tutorial training disk that introduces users to the most commonly used features of the Apple III's SOS operating system.

The Apple III Business System is priced at \$5,330. A 12-mo. carry-in service plan is available for the Apple III, Profile and Monitor III at a retail price of \$288.

Apple Computer, Inc. is located at 10260 Bandley Drive, Cupertino, Calif. 95014.

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# Alloy Line Runs With IBM, Compaq, TI Micros

FRAMINGHAM, Mass. — Alloy Computer Products, Inc. recently introduced four personal computer products including an integrated Winchester disk and backup unit, a credit card reader for personal computer keyboards, a 9-track tape controller for data interchange with mainframes and a cartridge tape drive for disk backup and archiving.

PC-Stor, the Winchester disk and backup package, combines a 54-in., 38 msec Winchester hard disk for data storage with a 6,400 bit/in. file-oriented cartridge tape backup unit. Available capacity is 33M or 43M bytes formatted, which can be increased to 86M bytes with the incorporation of a second disk.

Each cartridge in PC-Stor has a ca-

capacity of 16.5M bytes, and data transfer rates of up to 1M byte/min can be achieved with Alloy's Tape Interchange Package (TIP), the company said.

In addition to the IBM Personal Computer, PC-Stor will operate with personal computers made by Compaq Computer Corp., Columbia Data Products, Inc., Eagle Computer, Inc. and Texas Instruments, Inc. as well as other brands, Alloy noted.

The price of PC-Stor is \$4,995 for the 33M-byte unit and \$5,995 for the 43M-byte model.

The PC-Card is a magnetic-stripe card reader that attaches to a personal computer's keyboard. The reader can be used for such applications as security access control, password in-

put validation, credit card transactions and data logging. The price of the PC-Card, which includes a sample Basic program, is \$279.

The ITS-PC is an intelligent 9-track tape controller, supplied with or without the tape drive, that allows users to transfer data between personal computers and 9-track tapes for data exchange to mainframes. It also provides users with high-capacity, high-speed, file-oriented backup for Winchester disks, according to Alloy.

ITS-PC offers 42M bytes of working or backup storage and a disk-to-tape transfer rate of 1M byte/min. It supports 1,600 bit/in. tapes with user-specified formats from 128 byte/block to 9K byte/block and is priced at \$6,595.

Alloy's PC-Backup cartridge drive is a 4-track, 6,400 bit/in. unit that can accommodate 16.5M bytes on a single 555-ft cartridge. Both the 9-track and cartridge units are available with PC-TIP software under IBM's PC-DOS or Digital Research, Inc.'s CP/M 86. The TIP Package controls reading, writing and dumping operations and also provides utilities that allow the user to customize tape drive operations, Alloy noted. The price of the PC-Backup unit is \$2,195.

All four products are ready for immediate delivery, with dealer discounts available from the company at 100 Pennsylvania Ave., Framingham, Mass. 01701.

## Memory Board Gives Rainbow 256K Bytes

IRVINE, Calif. — Persyst, Inc., a microcomputer enhancement company, has introduced the Rainbow Memory Expansion Board that offers Digital Equipment Corp. Rainbow 100 users a single flexible board for expanding system memory up to 256K bytes.

The Memory Expansion Board allows users to add memory in 64K-byte increments utilizing a single board. Factory-configured versions of the board with 128K or 192K bytes of memory are also available.

User documentation is supplied with each Rainbow Memory Expansion Board and the Field Memory Expansion Kit at no extra charge.

Available now, volume shipments of the Rainbow Memory Expansion board are priced at \$335 for the 64K-byte board, \$440 for the 128K-byte board and \$525 for the 192K-byte board. The Field Memory Expansion Kit is priced at \$95.

Persyst is located at Suite A, 15801 Rockfield Blvd., Irvine, Calif. 92714.

## Card Provides Parallel Interface For STD Bus

OTTAWA — Dy-4 Systems, Inc. has introduced a high-speed parallel interface card for the STD bus.

The DSTD-408 card has been configured to be compatible with the QIC-2 3-in. tape interface protocol. A Zilog, Inc. Z80 data memory access (DMA) controller chip is used to gain the transfer speeds of up to 88K byte/sec required for the 90 in./sec streaming tape drives, according to a spokesman for the vendor.

Seven control signals plus two handshake signals are reportedly supported by the DSTD-408. When used with other Dy-4 STD modules, the DMA on the DSTD-408 can co-reside with up to three other DMA devices on the same bus, the spokesman said.

Prices range from \$225 to \$275, depending on quantity, the vendor said. More information is available from Dy-4 Systems, which is located at Len Place, Ottawa, Ont., Canada K1Z 5M1.



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# Immediate, Future Cost Savings

## Microimaging Seen Key to Future Office

By John A. Lacy

Spectator to CWI

The advanced technology incorporated into some of today's most sophisticated microimaging equipment promises to be the cornerstone on which tomorrow's office image-processing systems will be built.

Therefore, by carefully investing advanced micrographics technology today, offices can realize immediate cost efficiencies and gains in productivity as well as begin building a foundation of hardware and software that can help meet future image processing needs.

Specifically, concepts and products are being developed today that will permit the creation of a centralized document image storage file (similar to a centralized computer base), provide a way to transmit and receive document images at electronic speed from several locations and deliver extremely high-quality CRT displays of document images.

It is anticipated that tomorrow's image-processing systems will incorporate technology from several areas, including traditional micrographics, optical disk, computer electronics and even robotics. In some instances, the technology applications and results will startle the imagination.

### Major Image Processing Steps

The major steps in the image processing network of tomorrow include image capture, coding, indexing, storage, transmission, enhancement and editing as well as image retrieval and presentation. Much of the technology required for the successful accomplishment of these steps is already in place.

For example, the first step in the image processing requires capturing, coding and indexing document images. By using high-speed, intelligent rotary microfilm, document images can be captured easily and coded automatically.

The conversion of microimages to electronic signals offers several advantages:

- Images can be enhanced for readability. Irrelevant and unnecessary information such as graphics design on personal checks can be removed to make it easier to locate and verify pertinent information.

- Operators can selectively enlarge portions of document images.

- Annotation of alphanumerics over the image will be possible. In fact, the operator can create new images electronically.

- Several documents can be accessed from the file, electronically grouped and sent to the CRT terminal(s). These documents then can be called out for display



An experimental optical disk system at Eastman Kodak Co. can store about 100,000 pages of text.

*'It is anticipated that tomorrow's image-processing systems will incorporate technology from several areas, including traditional micrographics, optical disk, computer electronics and even robotics. In some instances, the technology applications and results will startle the imagination.'*

on an individual basis; and hard-copy prints can be made.

Another path for mass storage of images in the future might be optical disk technology, especially for the receipt and transmission of document images. Specifically, optical disk has great packing density, and its laser record/read methods provide a precise, high-quality way of capturing electronic signals such as those produced by scanning microimages.

Moreover, it allows information to be

verified at the same time it is recorded either from paper originals or from microfilm documents.

When using optical disk technology, information is captured by scanning and transforming that information into digital signals. The signals are transmitted to an optical disk recorder. Sophisticated laser technology codes information on the spinning disk and at the same time reads the information to verify its accuracy and quality.

Automated retrieval of optical disks might involve a principle similar to a juke box. Any one of many disks could be addressed from a remote location, moved to the drive mechanism automatically and played back on a CRT.

### Similar to Microimage Transmission

Capabilities to modify and manipulate images would be similar to the microimage transmission system. If the disk play-back unit held 100 disks — at 100,000 documents per disk — 10 million document images could be stored in a single device.

Along with microimage scanning or optical disk equipment, a device to produce hard-copy output from the electronic signals will be required, as will a computer link to provide an interaction between magnetics, film, optical disk and hard copy.

Therefore, the microimaging system of tomorrow is likely to consist of a centralized microfilm storage facility, a method of transmitting and receiving document images and an effective computer link that will enable the interchange of information from the wide variety of media in use today.

The main benefits of tomorrow's technology will include quick, economical access to information, reduction of paper work, reduced document-handling costs, increased productivity and a practical way to integrate document-related information from several media.

Lacy is the national sales manager for the Business Imaging Systems Business Systems Markets Division of the Eastman Kodak Co., Rochester, N.Y.

## 'Wordperfect' WP Enhanced To Support Variable Printers

OREM, Utah — Satellite Software International has announced the release of Version 3.0 of its Wordperfect word processing package.

Running on IBM Personal Computers and other Microsoft, Inc. MS-DOS-based

microcomputers, Revision 3.0 will reportedly enable the package to support the following printers in addition to NEC, Que Corp. and Epson American, Inc.: the Dabbie Systems, Inc. ECS 630; Okidata Corp.; Centronics Data Computer Corp. 351; HP Print Mate 150; Toshiba Corp. F1130; Digital Equipment Corp. LA-50; and Olympia U.S.A., Inc.

Version 3.0 includes a table-driven printer support and a setup menu, enabling users to map up to 52 keys from 126 ASCII symbols, according to a vendor spokesman.

Additional features include true proportional spacing, hyphenation cancel and document security.

Wordperfect is priced at \$495, which includes a spelling dictionary, math, automatic footnotes, text columns and a built-in spooler. The cost of the update for documentation, template and diskette is \$30.

More information is available from the vendor at 288 W. Center St., Orem, Utah 84057.

## 'Pecowriter/7000' Word Processor Out for PE Series 7000 Computer

NORWALK, Conn. — Perkin-Elmer Corp. has announced the Pecowriter/7000, described as a screen-oriented, word processing software package for use with the company's Series 7000 Professional Computers.

The package is said to feature automatic centering of titles, printing enhancements such as underlining and bold face, on-screen formatting and editing functions. The company said automatic reformatting allows text to be inserted anywhere within a document, and text can be moved,

copied, saved or deleted with the package, a vendor spokesman said.

Pecowriter/7000 may be used with any Series 7000 Professional Computer, and all files stored with the package are compatible with the company's optional Series 7000 Fortran-77 compiler and Basic Interpreter, according to the spokesman for the vendor.

Priced at \$350, the package will be available in November from PE, which is located at Main Ave., Mail Station 12, Norwalk, Conn. 06856.

OFFICE AUTOMATION

# Desktop Faxes, Autodialer Join Burroughs Line

DANBURY, Conn. — Burroughs Corp. has added three products to its facsimile line: two desktop digital machines and an autodialer that interfaces with both

units. The Dex 3200 is a CCITT Group 3, 2 and 1 facsimile that features a message verification capability called the Dex validator. When trans-

mission is completed, the receiving Dex 3200 faxes a hard-copy reception confirmation to the sending Dex 3200, including date, time, number of pages received

and the identification of the receiving terminal.

The Dex 3606 includes all three CCITT groups and also interfaces with the autodialer. Operating at 9,600 bit/sec, the Dex 3606 transmits a page in 20 seconds. Other features include automatic reduction of oversize originals, 30-page automatic feeder, activity reporting system, convenience copying and polling.

The Dex controller is an autodialer designed to perform a number of polling and sending transactions at

preprogrammed times throughout the day. It has a memory bank of 50 telephone numbers for automatic sending and polling. It can also be used as a standard telephone with two-digit speed dialing of all phone numbers stored in its memory, a vendor spokesman said. The price of the Dex 3200 is \$3,995, while the Dex 3606 costs \$5,495. The Dex controller is priced at \$825. More information is available from Burroughs, Image Systems Division, Danbury, Conn. 06810.

## What's next in Office Systems and Professional Computing?

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## 'Pen-Pal' for Apple II Creates Text, Graphs

INDIANAPOLIS — Howard W. Sams & Co., Inc., a subsidiary of ITT, has announced a word processing package running on Apple Computer, Inc. Apple II and compatible systems.

Designed for writing simple letters, complex documents, tables and forms, Pen-Pal features five Help menus and editing features such as global search-and-replace, global search-and-delete, block manipulation and formatting features.

Pen-Pal reportedly operates in two modes: the "thinks" mode, where text is entered without format considerations; and the "looks"

mode, which allows text to be viewed as it will appear in printed form.

Priced at \$59.95, the package is available from the vendor at 4300 W. 62nd St., Indianapolis, Ind. 46268.

## Daisywheel Said to Fit Most Micros

SADDLE BROOK, N.J. — Juki Industries of America, Inc. has introduced its Model 6100 daisywheel printer, an 18 char./sec unit compatible with most personal computers.

The Model 6100, which prints bidirectionally at 18 char./sec and utilizes 100-char. daisywheels, supports WP functions including superscript, subscript, bold/shadow printing, double strike and underlining, the company said. It also features graphics capabilities.

The standard buffer memory for the daisywheel printer is 2K bytes, expandable to 8K bytes. Centronics parallel interface is provided as the standard, with the RS-232C serial interface available as an option.

Optional paper-handling accessories include bidirectional tractor and a cut-sheet feeder.

The Model 6100 is priced at \$699 from Juki Industries, 299 Market St., Saddle Brook, N.J. 07662.

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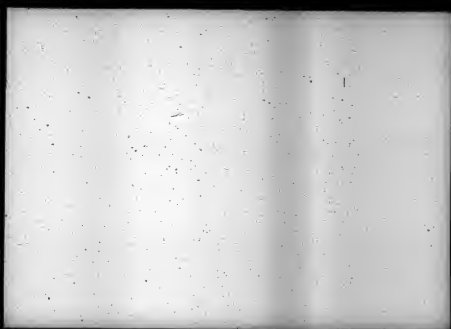
MAPS/GL was developed by Ross Systems under the name "FIDEL" and adapted for the VAX by Ross Systems. MAPS/GL requires only one FIDEL release. FIDEL on other computers.

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# User Needs Drive Micro Leasing Mart

By Patricia Keele

CW Staff

Short-term user needs and a fear of amassing obsolescent machines are driving the growing microcomputer leasing and rental market.

In response to customer demand, over the past year and a half a number of computer equipment leasing companies have expanded their offerings to include many of the top personal computers and small-business micros. The response, they say, has been tremendous.

In great demand at four such leasing firms are IBM's Personal Computer and Personal Computer XT. Typically, there was little demand for Apple Computer, Inc.'s Lisa, which was surpassed in popularity slightly by its older sibling, the Apple IIe.

Although one firm, Selecterm, Inc. of Danvers, Mass., caters almost exclusively to Fortune 500 corporations, the other three firms interviewed said their clients range from individual users to Fortune 500 members. The three firms include General Electric Co.'s Quick-Rental Instruments in Schenectady, N.Y.; U.S. Data Systems in San Mateo, Calif.; and Lesametic in Foster City, Calif.

Standard leases generally run from one to five years, with discounts for volume orders. Rentals, which can be had for as little as two weeks at GE's Quick-Rent, are sensitive to both the size of the order and the length of rental. The majority of demand comes from people with specific applications in mind, according to Donald Sobo, Lesametic's vice-president of marketing and sales. However, "People call us up and ask if we rent for this type of job, and [they] end up doing more with it, and the micro stays there," he added.

Big companies, in particular, base their rental and lease plans on a detailed cost analysis basis, added Phillip Cloufi, president of Selecterm.

"By leasing, users can swap their machines or get the latest upgrade without losing their investment. These changes usually occur within a year and a half after the product is introduced. . . . As a result, it is less expensive to lease if the life of the application is 40 months or less."

According to Ralph Marchetti, national sales manager for U.S. Data Systems, users cite many reasons for choosing to lease micros, including: to conserve cash or lines of credit and get the job done with a minimum of cash expenditure; to try before

buying; to handle short-term projects up to a year; to meet a need until the next budget cycle, when funds can be appropriated for purchases; and to take advantage of tax deductions.

However, an unwillingness to assume the technology risk inherent in a rapidly changing market was considered a key factor in the leasing and rental market. "Despite the fact that the major companies have standardized on the IBM [Personal Computer], there is a fair amount of obsolescence within the associated peripherals and the [Personal Computer] itself," Selecterm's Cloufi said. "The [Personal Computer] grows, gets upgraded, changes operating systems, and [these changes] are not 100% compatible." By leasing, users can swap their machines or get the latest upgrade without losing their investment. These changes usually occur within a year and a half after the product is introduced, he estimated. As a result, it is less expensive to lease if the life of the application is 40 months or less, Cloufi asserted.

(Continued on Page 92)

## Flexibility Of Leasing Makes Good Cents

By Patricia Keele

CW Staff

With microcomputers starting at under \$2,000, it doesn't seem likely that users would want to lease them. But for two Fortune 500 companies that have stepped up their micro leasing efforts over the past year, leasing makes good sense — financially and technologically.

"The primary reason we lease is flexibility, given the variety of technical leapfrogging that's been going on the past couple of years," said Steven Kelsky, vice-president of interactive computing services at the investment firm of Paine Webber-Mitchell Hutch-

(Continued on Page 92)

## Honeywell, NEC Agree in Principle To Business Deal

MINNEAPOLIS — Former transpacific partners Honeywell, Inc. and Nippon Electric Co. (NEC), estranged since late 1982, are in the process of reconciling.

Honeywell announced today an agreement in principle for a new business arrangement covering patents, copyrights and technical cooperation and granting Honeywell distribution and related manufacturing rights for NEC's large-scale computer products.

NEC grew up under Honeywell's wing and was granted Japanese rights to Honeywell technology in 1962. The relationship began to erode in 1980, however, and earlier this year [CW, Feb. 14] it appeared the two would butt heads when General Electric Information Services Co. announced that its network of Honeywell DPS-8 computers would be upgraded with NEC's S-1000 mainframe under NEC's Acos operating system, rather than Honeywell's announced DPS 88/81 under its Gcos operating system.

According to Honeywell, the pending agreement will see the U.S. company integrating the NEC machine with Gcos and granting Honeywell exclusive U.S. marketing rights.

During the previous 20-year relationship, according to Honeywell spokeswoman Kathy Tunheim, the two companies had distributed each other's products and participated in joint developments, but had also "chosen different options" in some areas. "By the end of 1982, what we had were two companies with similar technologies, but not with identical architectures or identical operating systems," Tunheim said.

The planned agreement will take the form of a 10-year contract, Tunheim said. She said the S-1000 has a processor speed about 40% faster than the DPS 88/81.

"This does not mean Honeywell will not continue to develop very large-scale computers on its own," she added. Rather, it gives the company an opportunity to "focus our investment" on competitive areas that the company might otherwise not be able to afford. Those areas include "primarily software areas, operating software beyond Gcos 8 and so on," Tunheim said.

## Federal Demand to Automate Seen Draining People Resource

By Bill Liberis

CW Staff

PALM SPRINGS, Calif. — The drive to modernize and automate the sprawling federal bureaucracy will drain valuable DPers from the private sector, pushing more organizations to seek the aid of professional services firms over the next few years.

But while this personnel drain will boost demand for professional services firms — the external program and system design specialists — it will also act as an impediment to their growth, as the public versus private competition for skilled DPers comes to a boil.

These were some of the observations gleaned from a comprehensive survey of the \$30-billion-plus software and services industry, observations presented at the recent 59th Management Conference of the Association of Data Processing Service Organizations, Inc. (Adapso) here.

The findings were reported by Peter Cunningham, president of Input, Inc., which conducted the industry survey by polling some 436 software and service companies. Most of the companies polled had sales in 1982 in excess of \$10 million.

Cunningham predicted that the 1984-85 time frame will bear witness to a "very dramatic increase" in demand by the federal government for DP services. This

## CW at Adapso

growth in demand will parallel the government's efforts to streamline its heretofore cumbersome operations, Cunningham said, adding that federal DP outlays will exceed \$50 billion by 1990 —, more than \$35 billion of which will pay for software.

(Continued on Page 94)



Input President Peter Cunningham



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## Federal Drain on DPers Forecast

(Continued from Page 91)  
ware and maintenance.

The government will attempt to satisfy this huge DP hunger by hiring more DPers.

This situation will create a people drain throughout the private sector, which will also turn to the professional services companies for help, Cunningham said. "I think clearly we will see that the availability of people becomes the biggest impediment to growth within the services industry, due in great part to what goes on at the federal government level."

But, curiously enough, when Input asked service industry executives what their biggest problems might be in the near future, few of them placed personnel shortages at the top of their list. Cunningham attributed this to short-sightedness on the part of service industry firms, re-

iterating that "the problem is off in the '84-'85 time frame... but is very real, nonetheless."

What did the service firms view as the key issue for the rest of the decade?

"Micros," said Edward Metz, Input vice-president.

Indeed, microcomputer-related issues have become the hottest topic within the Adapso membership, with more than one-third of the 36 work sessions at the conference dedicated to microcomputing in one way or another. In contrast, there were but two mainframe software sessions for the Adapso members, which still garner the vast majority of their sales writing, selling or servicing mainframe software.

Metz said the Input survey indicated that most large software and service companies either now offer microcomputer packages or systems or are planning on doing so soon. More than two-thirds of the software companies polled had micro product offerings, usually as part of a larger system offering.

This trend, he said, contrasts sharply with the companies' attitudes toward micros in years past, when micros were generally shunned by the Adapso membership.

Corroborating speculation of some industry observers, microcomputers are providing an increasingly low-cost solution for end users, a solution which allows some users to bypass more costly processing services companies. It is no coincidence, Metz said, that the processing services companies are rapidly expanding into other areas, such as professional services and systems integration.

However, Cunningham warned that users may be overemphasizing the applicability of micros in a professional DP setting.

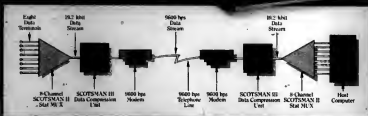
"You shouldn't send a boy to do a man's job," Cunningham said.

## Compaq, TI End Litigation

HOUSTON — Compaq Computer Corp. announced recently it had negotiated a patent license agreement with Texas Instruments, Inc., and both firms have settled all pending litigation against each other.

TI had charged in a federal suit filed last January that Compaq, among other things, had infringed upon several TI patents. Compaq filed a counterclaim alleging TI was engaged in unfair competition.

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# Remote Computing Seen Threatened

**PALM SPRINGS, Calif.** — "Incredible" advances in inexpensive hardware coupled with a broadening array of high-level software are creating a new breed of user. He is largely DP illiterate and, as he becomes comfortable with his machine, demands increasingly stronger dosages of support.

The same forces of change also pose a formidable threat to vendors of remote computing services, companies whose growth was spurred in the 1960s and 1970s by the relatively high cost of computing.

And unless remote computing services vendors react to the new challenges posed by the changing environment, they "will not be around in the future."

So said an individual whose job depends on meeting such challenges. Robert L. Dryden, president of Boeing Computer Services Co. and former strategic planner at IBM, who spoke at the recent 59th Management Conference of the Association of Data Processing Service Organizations, Inc. (Adapso) here.

## Micros a Threat

Dryden's warning to fellow remote computing services providers echoed the growing concerns of some industry observers and market analysts who claim that low-cost, increasingly powerful microcomputing will be the demise of large chunks of remote computing services business. They argue further, that remote computing services vendors cannot accommodate the growing cadre of non-DP end users.

Dryden, whose company sold more than \$600 million worth of remote computing services, software and professional services last year, advised his Adapso brethren to stop thinking of themselves as remote computing services vendors.

"We are now in the information services business. We must address a broader range of customers and computing problems. The trends of the 80s are forcing us toward in-house, integrated information solutions, support previously supplied remotely on an individual system basis," Dryden said.

## A Change in Course

Dryden set forth a number of suggested course changes for other remote computing services vendors to follow in navigating a shifting market. Changes he said Boeing has made or will undertake, included in his laundry list were:

- Development of ar-

chitectural standards to assist in a "phased organizational approach to implementing integrated systems."

- The establishment of information and utility and labor services to support information centers and advance programmer productivity and network administration.

- Increased on-site support for system installation, networking, solutions and user consultation.

## CW at Adapso

Dryden also seized the opportunity to take a swipe at governmental regulations, which he said are more costly to society than they are cost-effective. In particular, Dryden lashed out at proposed congressional legisla-

tion that would modify the access charges the Federal Communications Commission has previously outlined.

Referring to the similar House and Senate bills now pending [CW, Oct. 24], Dryden said, "Both bills are anti-business and anti-technology... The legislation could, according to analysts at Adapso, increase telecommunication costs by 50% next year alone."



DRYDEN TO B  
Robert L. Dryden

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# IBM, AT&T, Japan Forecast to Lead Micro Mart

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — IBM, AT&T and the Japanese will collectively dominate the personal computer business by the 1990s and will end Apple Computer, Inc.'s long reign as the leader in its field, according to Perfect Software, Inc.'s president, Robert Glidden.

Speaking at the first National Software Show held here recently, Glidden depicted a future in which a triumvirate of "megagiants" will struggle mightily for personal computer dominance, with Apple continuing to grow, but stripped of its former preeminence.

Glidden likened the impending microcomputer conflict to an all-out

war, whose first big "battlefield" is likely to be the software industry, which each of the Big Three combatants has "targeted for conquest," he said.

## Rely on Software

As Apple has already done with its much celebrated Lisa system, the Big Three micro suppliers will rely heavily on their own proprietary software to leverage future hardware sales, Glidden predicted.

Portents of the coming battle for personal computer supremacy will probably begin to appear sometime next year when AT&T is expected to enter the micro fray with the introduction of a small system based on Unix, he added.

AT&T's manufacturing and technological prowess, as embodied in its Western Electric and Bell Laboratories subsidiaries, gives the company's predicted assault on the personal computer field a high probability of success.

In fact, by the end of the century, AT&T will be practically indistinguishable from IBM, each company

having successfully invaded the other's traditional turf, Glidden predicted.

What will propel the Big Three into the front ranks of the personal computer field, more than any other factor, is their ability to "marshaled their resources" and "systematize" the mass manufacturing of new products, Glidden said.

## AT&T Third-Quarter Profits Slide, Revenues Up 5%

NEW YORK — AT&T announced lower than expected earnings for its third quarter, reporting profits of

\$1.46 billion, or \$1.51 per share, compared with \$2 billion the same period a year ago. Revenues in the quarter rose 5% to \$17.5 billion from \$16.6 billion.

Earnings for the nine-month period ending in September were pegged at \$5.1 billion, down from \$5.8 billion in 1982. Sales in the period were up 7% to \$52 billion.

Charles Brown, AT&T chairman, said the results do not indicate a trend of declining profit, but "rather are the products of crosscurrents in the economy, in our operations and in our efforts to ready the Bell system for divestiture."

Noting the relatively slack economy, Brown said, "The lingering effects of the recession are still with us. Long-distance revenues are up only 3% over a year ago. Western Electric sales to the Bell companies are substantially below forecast, reflecting tight control of capital budgets and vigorous expense control measures."

The third-quarter results were accompanied by the announcement that AT&T will take a \$5.2 billion charge against 1983 earnings in anticipation of the company's divestiture taking place next year [CW, Oct. 24].

## Hogan Systems Acquires Henco

DALLAS — Hogan Systems, Inc. recently announced the acquisition for an undisclosed price of Henco Research, Inc., a New York-based company specializing in software systems for banking operations.

Henco, founded in 1976, specializes in computing software for international banks and the international departments of large domestic banks. Its major product is the International Banking Management Systems, a group of nine systems that can be used independently or in an integrated fashion, according to a Hogan spokesman.

Hogan President Richard Streller said the acquisition should contribute significantly to the company's efforts in the international marketplace. Hogan currently provides on-line applications software to banking customers in Australia and New Zealand and is marketing in Great Britain.

Henco's software products reportedly are designed to improve profitability of international banking operations through better control and coordination of all internal banking functions.



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## Nicks & Dimes

**Automatic Data Processing, Inc.** has recorded revenues of \$202 million and net earnings of \$13.6 million for the third quarter of fiscal 1984, ended Sept. 30, both up 17% from the same period last year.

\$\$\$

**Roim Corp.** has announced orders for the first quarter of 1984 ended Sept. 30 of \$146 million, up from \$100 million for the first quarter last year, and an order backlog of \$237 million for the period, compared with a \$149 million backlog in the first quarter of 1983.

\$\$\$

**Integrated Software Systems Corp.** has reported revenues for the third quarter ended Sept. 30 of \$6.3 million, compared to \$4.4 million for

the third quarter of 1982.

\$\$\$

**Computer Task Group, Inc.** revenues for the third quarter ended Sept. 30 were \$13.5 million, a 38% increase over the same period last year. Revenues for the first nine months of 1983 totaled \$37.9 million, a 27% increase over 1982.

\$\$\$

**Ask Computer Systems, Inc.** has reported revenues of \$12.4 million and net income of \$991,000 for the first quarter of fiscal 1984, increases of 76% and 21%, respectively, over the first quarter of 1983.

\$\$\$

**Computer Consoles, Inc.**'s net income for the third quarter ended Sept. 30 was up 228% over last year's

third quarter. Revenue for the quarter totaled \$23.6 million, up 55% over last year, while net income was \$4.1 million, or 32 cents per share, compared to \$1.2 million, or 11 cents per share, for the third quarter of 1982.

\$\$\$

**Cray Research, Inc.** has reported revenue for the first nine months of 1983 of \$66.9 million, compared to \$75.5 million for the same period last year. Earnings for the period were flat at \$6.7 million, compared to \$6.8 million for last year.

\$\$\$

**Tandy Corp.** has announced consolidated sales for the first quarter of fiscal 1984 of \$563.4 million, an increase of 13% over the first quarter of 1983. Net income rose 11% for the

quarter to \$59.6 million.

\$\$\$

**Informatics General Corp.** has announced increases in net income of 72% and 71%, respectively, for the third quarter and the first nine months ended Sept. 30. Income for the quarter rose to \$2.3 million, while income for the first nine months was \$4.2 million.

\$\$\$

**Computer Sciences Corp.**'s revenues for the quarter ended Sept. 30 increased 11% to \$184.4 million from \$166.1 million a year ago. Net earnings for the quarter of \$4.4 million, or 32 cents per share, were flat compared to last year's \$4.1 million, or 31 cents per share.

\$\$\$

**Ungermaier-Bass, Inc.** has reported a 122% increase in net revenues for the third quarter and a 127% increase for the nine months ended Sept. 30. Net income for the quarter was \$891,000, or five cents per share, compared to \$91,000, or one cent per share, for the comparable period last year.

\$\$\$

**NBI, Inc.** has reported that revenues for the first fiscal quarter ended Sept. 30 increased 41% to \$38.4 million, up from the \$27.2 million reported for the comparable period last year. Net income for the first quarter was \$2.5 million, a decrease of 19% from the first quarter of last year and an increase of 115% compared with the fourth quarter of fiscal 1983.

\$\$\$

**Hogan Systems, Inc.** has reported net earnings of \$1.8 million, or 29 cents per share, for the second quarter ended Sept. 30, compared to net earnings of \$364,000, or 7 cents per share, for the same period last year.

\$\$\$

**Apollo Computer, Inc.** has reported 1983 third-quarter net income of \$3 million, or 15 cents per share, compared to \$203,000, or one cent per share, for the third quarter of last year. Net sales for the period were \$21.1 million, compared to \$4.8 million for 1982.

\$\$\$

**Altos Computer Systems, Inc.** has reported net sales for the first quarter of fiscal 1984 of \$18.4 million, a 4% increase over the comparable period in fiscal 1983. Net income for the period dropped to \$1.1 million, compared to the \$1.8 million posted for last year.

\$\$\$

**Corvus Systems, Inc.** has reported an 82.6% increase in net income and a 47.8% rise in sales for the first quarter of fiscal 1984, ended Aug. 31. Sales totaled \$14.9 million, and net income was \$1.4 million, or 14 cents per share, compared to sales of \$10 million and net earnings of \$722,000, or 9 cents per share, for the same period last year.

\$\$\$

**Burroughs Corp.** has filed a registration statement with the Securities and Exchange Commission covering three million newly issued shares of common stock. The offering will be underwritten by a group managed by Lehman Brothers Kuhn Loeb, Inc.; Goldman, Sachs & Co.; and Lazard Freres & Co.

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## CDC Reports Earnings Jump Of Almost \$2 Million

MINNEAPOLIS — Control Data Corp. recently reported that earnings for the third quarter ended Sept. 30 were \$40.7 million, or \$1.05 per share, up from \$39 million, or \$1.03 per share, reported for the same period last year.

The company reported revenues of \$1.2 billion for the period, up from \$1.1 billion last year, and revenues for the first nine months of this year of \$3.333 billion, up from \$3.175 billion last year.

As in the preceding quarter, CDC reported, increased earnings in the area of information services and products, along with a lower provision for taxes, offset lower pretax

earnings from its financial services. Consolidated pretax earnings amounted to \$49 million for the quarter and \$143 million for the nine months, as compared to last year's \$57.9 million for the quarter and \$173.8 million for the comparable nine-month period.

The company said continued strengthening of computer-related businesses, along with some improvement in financial services, are expected to result in higher earnings for the total year. After nine months, earnings were \$113 million, or \$2.94 per share, compared to last year's figure of \$111.3 million, or \$2.95 per share.

## Sprint Buy Boosts Profits

## GTE Announces 19% Gain

STAMFORD, Conn. — GTE Corp. recently reported a 19% increase in third-quarter earnings compared to the same period last year, with a 14% increase in revenues that reflects the recent acquisition of the Sprint long-distance telephone company.

GTE reported that consolidated net income for the third quarter was \$236 million, up from \$200 million a year earlier; per-share earnings rose 10% to \$1.22 from the \$1.11 reported last year.

Revenues and sales were reported at \$3.3 billion for the third quarter, compared to \$2.9 billion a year ago, and a large portion of that increase was a result of the Sprint acquisition.

A new business grouping includ-

ing Sprint, satellite and GTE Telenet operations showed revenue of \$251.3 million, compared to \$26.7 million reflected in the corresponding quarter last year.

Earnings for the new grouping were reported to be \$12.8 million for the quarter, compared to a loss of \$2.1 million a year earlier. GTE said it was a result of the Sprint acquisition and increased demand for specialized communications services offered by GTE Telenet.

Theodore F. Brophy, chairman and chief executive officer of GTE, cautioned that a recent Federal Communications Commission (FCC) order "would effectively stifle competition in the long-distance telephone market" by more than doubling access charges paid by GTE Sprint and other intercity carriers. "We are vigorously opposing this action and hope the FCC will modify the order accordingly," he said.

## CCIA Offers Exec Seminars On Law, Exports

WASHINGTON, D.C. — The Computer & Communications Industry Association (CCIA) has announced two additions to its ongoing program of executive seminars.

"Exports — The Key to Increased Profits" and "Current Issues in Computer and Communications Law."

The seminar on exports will be held Nov. 1 at the L'Enfant Plaza Hotel here. The one-day conference will focus on strategic, tactical, and legal perspectives to provide novice and veteran international marketers with the practical, comprehensive information needed to increase profits.

Topics will include an overview of Commerce Department programs for exporters, the Export Trading Company Act and how to use it and the Export Administration Act of 1983. Keynote speaker Donald V. Earnshaw, deputy assistant secretary for export development of the Department of Commerce, will discuss "The President's Plan to Create a Department of International Trade and Industry."

The second seminar is slated for Nov. 10, also at the L'Enfant Plaza Hotel. The areas to be covered include legal implications of advances in technology, current developments in securities law, trends in litigation, software protection and antitrust policy. The keynote address, "Future Computer and Communications Technology: Implications for Your Practice," will be delivered by Richard E. Wiley, founder and senior partner in the Washington, D.C.-based law firm of Wiley, Johnson & Rein.

Registration at these two conferences is limited. Costs for each seminar are, respectively: \$245 for the first CCIA member; \$195 for each additional registrant; \$245 for each nonmember; \$295 for each additional non-CCIA member from the same company. More information is available from CCIA, 1500 Wilson Blvd., Arlington, Va. 22209.

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source. Three Buyer's Guides are to be produced in 1983: **Computer Systems** (August); **Terminals and Peripherals** (October); and **Software** (November).

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1. BUSINESS/INDUSTRY (Circle one)  
 End Users  
 10 Manufacturer (other than computer)  
 20 Financial/Insurance/Real Estate  
 30 Medical/Health/Pharmacy  
 40 Wholesale/Retail Trade  
 50 Business Services (not a DP)  
 60 Government/State/Federal/Local  
 70 Public Utilities/Transportation  
 80 Mining/Construction/Processing/Refining  
 90 Other User
2. OCCUPATION/FUNCTION (Circle one)  
 10 President/Chief Executive/General Manager  
 11 VP/Assistant VP  
 12 Treasurer/Controller/Financial Officer  
 20 Plant/Operations/Production/Planning/Consulting  
 30 Director/Manager/Supervisor/DIV/MS Services  
 40 Director/Manager of Operations/Planning/Advisory Services  
 50 Systems Manager/Systems Analyst  
 60 Manager/Supervisor/Programmer  
 70 Programmer/Methods Analyst  
 80 QA/VP Director/Manager/Supervisor  
 90 Data Control/Network/Systems Mgmt  
 10 Equipment/REG/Tools Mgmt  
 11 Mfg Sales Rep/Service/Training Mgmt  
 20 Consulting Firm  
 30 Medical/Legal/Accounting Mgmt  
 40 Educator/Author/Editor/Writer/Artist  
 50 Other
3. COMPUTER INVOLVEMENT (Circle all that apply)  
 Types of equipment with which you are personally involved  
 either as user, vendor or consultant  
 A. Mainframe/Supersystem  
 B. Minicomputer/Small Business Computers  
 C. Microcomputer/PC  
 D. Communications Systems  
 E. Other Automation Systems



## Burroughs Reports Earnings For Third Quarter Up 16%

DETROIT — Burroughs Corp. recently reported earnings for the third quarter were up 16% to \$42.5 million compared to the third quarter of 1982, as revenues increased 2% to just over \$1 billion. Earnings for the first nine months of this year were up 10% over the corresponding period last year, but revenues remained relatively flat.

Chairman and Chief Executive Officer W. Michael Blumenthal said that the strong U.S. dollar "continues to impact negatively our results" in international operations, but that U.S. activity is gaining momentum.

For the first nine months, revenue was essentially the same as the period a year earlier, \$3.1 billion, as sales revenue was flat and rental revenue decreased, according to Burroughs.

The third-quarter earnings of

\$42.5 million, or \$1.01 per share, compared to \$36.8 million, or 87 cents per share, in the corresponding period last year. Blumenthal said he was encouraged by a 35% increase in earnings before taxes.

New products announced over the past year were strong contributors to the gains in orders, the company said.

Worldwide orders during the quarter were reported to be "good," while domestic order activity was said to be strong.

During October, a company spokesman reported, Burroughs raised \$150 million by issuing three million new shares of common stock.

## Honeywell Airs 33% Rise In Earnings for Third Quarter

MINNEAPOLIS — Honeywell, Inc. recently reported earnings of \$58.4 million in the third quarter ended Oct. 2, up 33% from the \$44 million in earnings reported in the corresponding quarter one year ago. Earnings for the nine months ended Oct. 2 were substantially lagging for the corresponding period last year, however.

Earnings per share were up 30.1% to \$2.55, compared to the \$1.96 reported a year ago. Revenues for the quarter were up 5.3% to \$1.406 billion.

Edson Spenser, chairman and chief executive officer, said, "Domestic computer orders continue to make

significant gains over the reduced levels of last year." International computer orders for the quarter were about even with 1982, he added.

Cost savings in the information systems business produced substantial benefits, and operating profit was up sharply over the previous year, Honeywell said.

For the first nine months, however, Honeywell reported earnings were down 24.7% to \$139.3 million, from last year's pace of \$184.9 million; earnings per share for the nine months were off \$2.17 from the previous year, when Honeywell recorded a \$90.8 million gain on sales of interests in other companies.

## Raytheon Posts Drop in Earnings For Quarter

LEXINGTON, Mass. — Raytheon Co. recently reported third-quarter earnings were \$6.9 million less than during the same period last year, with defense electronics sales said to be showing strong growth in volume and diversity.

Earnings for the period ended Oct. 2 were \$7.6 million, or 90 cents per share, compared to the \$82.9 million, or 96 cents per share, reported for the same period in 1982.

During the first nine months of this year, sales have grown to \$4.397 billion from the \$4.148 billion reported in the same nine-month period last year, but net income has declined this year to \$227 million, or \$2.68 per share, from last year's \$248 million, or \$2.94 per share.

Raytheon's backlog of total orders stands at \$5.686 billion, with \$3.349 billion funded by the U.S. government, compared to last year's \$6.073 billion, with \$2.640 billion funded by the U.S. government.

## Prime Reports 32% Profit Dip

NATICK, Mass. — Profit at Prime Computer, Inc. slid 32% in the third quarter to \$7.6 million, or 16 cents per share, down from \$11.1 million during the same period a year ago. The minicomputer maker's revenues for the quarter were up 20% to \$131 million.

Commenting on the results, Joe M. Henson, president and chief executive officer, said, "Prime's revenue gain reflects the increase in incoming orders experienced during the quarter. However, earnings were below the comparable quarter last year as a result of gross margin pressure and continuation of Prime's long-term investments in [research and development], customer service and marketing programs."

Henson said shipments of the company's 9950 superminicomputer are strong.

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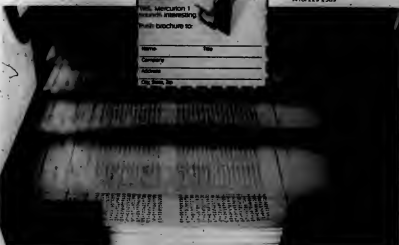
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## Supershorts

Dallas-based Genra Group, Inc., formed by a group of investors, has agreed to acquire most of the 54 retail stores of Xerox Corp. and become an authorized Xerox dealer. A spokesman for Genra said the group will specialize in selling computers and business equipment and, with the Xerox locations as a foundation, open a "significant" number of additional outlets nationwide. A Xerox spokesman said the sale of its retail stores represents a step in changing the company's retailing strategy to the use of authorized retailers. Xerox plans to assume an equity position in the group through its venture capital operation, while supplying management talent. The plan calls further for Xerox store personnel and store management to remain in place.

Ultimate Components, Inc., a subsidiary of Storage Technology Corp., has acquired Global Software, Inc., marketer and developer of IBM-compatible computers and a line of turnkey systems, for an undisclosed sum. Global will continue to operate with its existing management. Global's systems compete with IBM 4300-class machines.

Automatic Data Processing, Inc. has transferred its Automail computer-based message system to ADP Autonet, the company's public data network division. The Automail product has previously been supported by ADP Network Services, the company's remote computer services division, which will also continue to sell and support the service.

Digital Research, Inc., Pacific Grove, Calif., and Teletype Systems, Inc., Sunnyvale, Calif., have entered into a technology exchange agreement under which Teletype Systems has provided Digital Research with the rights to market and further develop Teledraw, a graphics software package that creates diagrams and other pictures on personal computers.

Titsch Communications' research division International Communications Research (ICR) has formed a new unit, the ICR Information Division, and named William R. Polchuk Jr. executive vice-president and general manager. The unit will refine and market the Cable Information Service, ICR's CATV data base.

and will develop additional data base and marketing information systems for the telecommunications industry as well as for the automotive industry.

Computer Consoles, Inc. (CCI) of Rochester, N.Y., and Standard Telephone & Cable Ltd. (STC), London, have signed a \$34 million contract to provide CCI's computerized telephone Directory Assistance System to the UK. STC will supply the equipment to British Telecom, manager of the telephone system.

Paradyne Corp. has filed its answer to the suit filed in March 1983 by the Securities and Exchange Commission (SEC), denying the SEC's allegations concerning Paradyne's contract to supply PDN 8400 intelligent terminal systems to the Social Security Administration. Company President Robert S. Wiggins stated that his firm had acted properly in winning the contract and had performed satisfactorily under the contract.

Northern Telecom, Inc. has made the message system interface specifications for its SL-1 digital business communications systems available to other manufacturers of communications, data processing and office equipment. The specification is available for a one-time licensing fee of \$500.

## Executive Corner

• Richard G. Taylor has joined ITT Dialcom, Inc. as senior vice-president of marketing.

• Stephen J. Durham has been named to the position of vice-president of marketing at Cermat Microelectronics, Inc.

• Robert J. Hingre has been appointed president of Mohawk, Data Sciences Corp.'s (MDS) Herkimer Division and has subsequently been elected a senior vice-president of MDS.

• Gerald F. Clancy has been promoted to the position of vice-president of software development at Synapse Computer Corp. In addition, Brad P. Hebert has been named to the position of vice-president of customer services at Synapse Computer.

• Dr. John D. Faulken and Gen. Walter S. Lotz (U.S. Army, Ret.) have both been named to the board of directors of Basic Telecommunications Corp.

• David M. Weishaar has been named vice-president of manufacturing at Ztel, Inc.

• Jan F. Ahart has been elected vice-president and treasurer of Datapoint Corp.



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## POSITION ANNOUNCEMENT COLLEGE OF VETERINARY MEDICINE MISSOURI STATE UNIVERSITY COMPUTER SYSTEMS ANALYST

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2. Maintain all applications software.
3. Design, implement, and supervise the development of applications software for the College of Veterinary Medicine.
4. Coordinate, instruct and assist with Medical Records, Animal Health Center, Research and other College of Veterinary Medicine functions.
5. Supervise personnel, as appropriate.

Applicants must have experience related to systems management of a microcomputer. Experience with ALUAC programming language and COBOL medical programmer's edition or similar systems is highly desirable. A B.S. degree in computer science or related area is required. Advanced degree preferred. (E-mail resumes to: [msucomp@msu.edu](mailto:msucomp@msu.edu). Applicant must have system programming ability.)

Salary commensurate with experience. Send letters of application, including current resume and names of three references to: December 5, 1983, to:

Dr. Stephen Housler, Assistant Coordinator  
Support Staff and Budget  
College of Veterinary Medicine  
Drawer V  
Missouri State, MO 64503

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Outstanding company benefits, company contribution to employee welfare plan, relocation assistance available. Please send resume with current salary data to: Gary VanBuren, Personnel Manager for Consulting, 1 Marinette Plaza, Suite 1300, San Francisco, CA 94111. (415) 954-7130. Employer assumes fee.

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## ASSOCIATE EDITOR

Software Spectrum magazine, the new user friendly computer magazine, has an opportunity for an individual who is very knowledgeable in computer systems, and programming, has several years of experience in magazine editing, and has the ability to be effectively to inform and stimulate computer users of all levels of expertise. We offer an excellent compensation package as well as a challenging creative milieu for:

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## ADP Security Specialist

Delaware Federal Reserve Center is seeking applicants for the position of Security Specialist. Position involves design, development, and implementation of ADP security programs, monitoring experience in both areas of ADP threat prevention, systems security and a background in hardware and software. Position may be filled at GS-11, GS-12, GS-13, GS-14, GS-15, GS-16, GS-17, GS-18, GS-19, GS-20, GS-21, GS-22, GS-23, GS-24, GS-25, GS-26, GS-27, GS-28, GS-29, GS-30, GS-31, GS-32, GS-33, GS-34, GS-35, GS-36, GS-37, GS-38, GS-39, GS-40, GS-41, GS-42, GS-43, GS-44, GS-45, GS-46, GS-47, GS-48, GS-49, GS-50, GS-51, GS-52, GS-53, GS-54, GS-55, GS-56, GS-57, GS-58, GS-59, GS-60, GS-61, GS-62, GS-63, GS-64, GS-65, GS-66, GS-67, GS-68, GS-69, GS-70, GS-71, GS-72, GS-73, GS-74, GS-75, GS-76, GS-77, GS-78, GS-79, GS-80, GS-81, GS-82, GS-83, GS-84, GS-85, GS-86, GS-87, GS-88, GS-89, GS-90, GS-91, GS-92, GS-93, GS-94, GS-95, GS-96, GS-97, GS-98, GS-99, GS-100. Closing date 11/15/83. U.S. citizenship required.  
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## SYSTEMS DEVELOPMENT MANAGER

Strong management skills with 8+ years in this progressively increasing technical position. Position involves design, development, and implementation of business systems for financial, manufacturing and marketing systems. Large scale IBM, Fujitsu, and other systems. Position may be filled at GS-11, GS-12, GS-13, GS-14, GS-15, GS-16, GS-17, GS-18, GS-19, GS-20, GS-21, GS-22, GS-23, GS-24, GS-25, GS-26, GS-27, GS-28, GS-29, GS-30, GS-31, GS-32, GS-33, GS-34, GS-35, GS-36, GS-37, GS-38, GS-39, GS-40, GS-41, GS-42, GS-43, GS-44, GS-45, GS-46, GS-47, GS-48, GS-49, GS-50, GS-51, GS-52, GS-53, GS-54, GS-55, GS-56, GS-57, GS-58, GS-59, GS-60, GS-61, GS-62, GS-63, GS-64, GS-65, GS-66, GS-67, GS-68, GS-69, GS-70, GS-71, GS-72, GS-73, GS-74, GS-75, GS-76, GS-77, GS-78, GS-79, GS-80, GS-81, GS-82, GS-83, GS-84, GS-85, GS-86, GS-87, GS-88, GS-89, GS-90, GS-91, GS-92, GS-93, GS-94, GS-95, GS-96, GS-97, GS-98, GS-99, GS-100. Closing date 11/15/83. U.S. citizenship required.  
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## Sr. Programmer/Analyst

Design and implement computer system. Analyze test run and direct any necessary corrections. Review programs and application system to increase efficiency and conserve storage area. Must have experience on S/36, 3-5 years RPG programming. Must have IBM and communication knowledge.

Send resume to Programmer, PO Box 904, Bonita, CA 94015.

## IMS PROFESSIONALS

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Applicants should send complete resume including address and telephone number, photograph of credentials, and names and addresses of three references to:

King Saud University Office  
 2425 West Loop South, Suite 450  
 Houston, TX 77027  
 Attn: Mrs. Norma Carbone



#### COMPUTING MANAGER

##### University of Arizona

The data processing department of the University of Arizona seeks applicants for a Computing Manager, holding immediately.

The individual will be responsible for developing long range strategic, operational and tactical plans and for the management of the computing resources of the University of Arizona.

The position reports to the Director for Data Processing in the division of Administrative Services in the University of Arizona, a major research university located in the United States.

A bachelor's degree in computer science or a related field is required, a master's degree preferred.

The successful candidate must possess a minimum of five years experience in the management of computer resources, preferably in a large state university environment, as well as in the management of computer resources in a large state university environment.

Resumes and letters of application should be sent to: Dean of the College of Business, University of Arizona, 1221 N. Central Ave., Tucson, AZ 85721. Closing date for applications is November 15, 1983.

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##### \* PICK \*

Deschutes County is accepting applications for Data Processing Manager. The position requires knowledge of the properties and practices of systems analysis and computer programming associated with a multi-job computer. It requires the ability to analyze, design, develop, test, and maintain the data processing system; ability to remain current of technical developments in the data processing field; to evaluate and maintain working relations with representatives of local industries, County management, and subcontractors. Applicants with Microfilm and PICK experience are encouraged to apply.

The area, located in the heart of the State, Deschutes County encompasses the snow-capped Cascade and the fertile valley, large and forest lands of the "high country" in the Central Oregon plateau. It has experienced the most rapid growth of any county in the State during the last 10 years. Principal products are timber, plywood, cattle and horses. A number of luxury resorts are also located. Skiing, hunting, golfing and fishing are popular attractions. The County comprises 3,800 square miles with a population of 87,000.

If you are interested in applying for this position, please send a resume and salary requirements to:

Deschutes County Personnel Office  
 Courthouse Annex  
 Bend, Oregon 97701

Deadline for applications is November 24, 1983. Any additional information may be obtained by writing the above address or calling (503) 388-6670. Attention: Mike Meier, Administrative Director. EOE/AA

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## Graphics Display

"With the introduction of its model 4115 computer display terminal... Tektronix set new performance levels of raster-scan graphics displays and bit image manipulation."

April 11, 1983 EE Times

"Tektronix is plowing new ground with its model 4115 color raster system."

April 1983 The Anderson Report

The introduction of the 4115 set new standards for High Resolution Computer Display Terminals. Its development includes many state-of-the-art techniques to produce high performance graphics with unmatched display quality. The continued development of this product as well as development of future products requires that we add engineering staff if you are interested in working on an industry leader and with a firm recognized for technological innovation, you may want to consider one of the following positions:

**Sr. Software Engineers**  
Design major firmware enhancements & firmware modifications to the 4115

**Software Engineers**  
Participate in the design of 3D graphics transformations

**Software Engineers**  
Design/implement/test firmware for new products based on 4115 technology

**Hardware/Software Engineers**  
Design and write microcode for a bit-slice picture processor used in new graphics terminals

**Electronics Engineers**  
Contribute to the development of new products in the 4100 series of Graphic Display Terminals

**Microelectronics Component Engineers**

Expand the utilization and application of VLSI technology in graphics systems and participate in the development of the next generation of graphics display products

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For immediate consideration, send resume to: DATA Resources Corporation, 1331 Buchanan Rd., Suite 100, Atlanta, GA 30304. Equal Opportunity Employer.

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You will manage either multiple VAX or TANDÉM Nonstop II hardware systems, coordinate vendor maintenance, maintain operating systems, and perform system engineering functions, such as performance monitoring and measurements. Both of these positions require a BS degree in Computer Science and 7-9 years hardware/software experience. Additionally, 4-5 years experience with related equipment and operating systems, and 3-4 years data communications experience are required, as are strong interpersonal, management, and communication skills. Experience with X.25 network desired.

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Whether you choose to work in Santa Clara, Austin, Portland or Phoenix, you'll find that Intel offers a wealth of opportunity and a climate geared for achievement. Examine the following openings and respond to the location of your choice.

## AUSTIN, TEXAS

### SYSTEMS ENGINEERS

For software and hardware product planning for operating systems, communications and database management. Requires a BS/CS, BS/EE or equivalent technical experience.

### APPLICATIONS & SYSTEMS PROGRAMMERS

With 3+ years of experience in one or more of the following: IBM, OS, CICS ASSEMBLER in VM, CICS or CICS/Environment, CDC NOS/NOSE, UNIVAC environment. Mini and/or microcomputer environment. BS/CS or equivalent.

For immediate consideration, send your resume to Pat Brewer, Intel Employment, Dept. 7174, P.O. Box 9668, Austin, TX 78768.

## SANTA CLARA, CALIFORNIA

### SR. BUSINESS SYSTEMS ANALYST

3 - 5 years project leader/senior analyst experience with proven project management success and good analytical and problem solving skills. A background in industrial engineering, prototyping, software design and development methods and experience with large mainframe systems is helpful. BA/BS/CS desired.

### SR. SYSTEMS PROGRAMMERS & SYSTEMS PROGRAMMERS

4 or more years of systems programming background. IBM OS/MS, VM/CMS, or HP3000 MPE/innocence. BS/CS preferred.

### SR. PROGRAMMER/ANALYSTS & PROGRAMMER/ANALYSTS

4 or more years applications programming. IBM OS/MS, VM/CMS or HP3000 IMAGE/DATABASE. 2+ years experience with CICS/MS, APL, FOCUS, or TSO/CLIST/SPF/JCL desired.

### COMMUNICATIONS ANALYSTS

5+ years as a Voice Technician with a thorough knowledge of problem analysis and telephone

switching systems. BS/CS preferred. 3+ years experience in large scale computer networks. BS/EE preferred.

### COMPUTER CAPACITY MANAGER

3-5+ years experience in capacity management, computer performance evaluation, project management, SAS, Assembler language and modeling techniques is essential. Knowledge of OS/MS and VM environments required. BS/CS desired.

For immediate consideration, call Becky Canary at (408) 496-8188 or send your resume to Intel Employment, Dept. 7174, P.O. Box 2546, Santa Clara, CA 95051.

## PHOENIX, ARIZONA

### SOFTWARE PRODUCT ENGINEERS

To analyze and approve software, consult with development engineers, direct testing to ensure software quality. BS/CS or equivalent technical experience preferred.

For immediate consideration, call Max Anderson at (602) 868-4498 or send your resume to Intel Employment, Dept. 7174, 2402 W. Beardsley Rd., Phoenix, AZ 85027.

### TELECOM DESIGN ENGINEER

Medium design experience. Knowledge of switching equipment and telecom controllers. MS/EE and 5 years experience in telecom/circuit design required.

### COMPONENTS RELIABILITY ENGINEER

Reliability/QA experience at circuit level. Yield analysis and device failure analysis experience required. MS/EE or MS/Physics and 3-5 years QA experience in semiconductor device environment.

For immediate consideration, call Chris Kumbat at (602) 961-2914 or send your resume to Intel Employment, Dept. 7174, 5000 W. Wilshire Field Rd., Chandler, AZ 85224.

## PORTLAND, OREGON

### FILE SYSTEM DESIGN MANAGERS

To design a file system for an advanced computer system used in single node and distributed environments. Requires an MS/EE or CS and 1 to 4 years of related experience.

### TECHNICAL PUBLICATIONS MANAGER

To manage a staff of writers in developing hardware and software technical manuals. Requires a BS/CS/EE and 2 years of successful management experience.

### OPERATING SYSTEMS ARCHITECT

To provide technical leadership in developing architecture for a new operating system for 32 bit microprocessor. Requires a MS/CS and 1 to 4 years of experience in system software and architecture for sophisticated operating systems.

### GRAPHICS SOFTWARE ARCHITECT

To provide technical leadership in the development of graphics software and hardware requirements for new VLSI products and graphics hardware. Requires a MS/CS, 1 to 4 years of software development and 1 year as project leader in graphics.

### OPERATING SYSTEMS ENGINEERS

Requires a broad background in applications, real-time processing and test/debug/integration. Requires a BS/MS in EE/CS and experience with UNIX, VMS, RISC and ICE. 86-96/51/85.

For immediate consideration, call Mike Gore at (503) 681-4592 or send your resume to Intel Employment, JF-1-149, 5200 NE Elam Young Parkway, Hillsboro, OR 97123.

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## Choosing to work with the wrong DBMS company is no laughing matter.

Choosing the wrong software company to work for can be a hard fact to face up to. We'd like to help you save face. We're Computer Corporation of America. The braintrust that brought forth the **MODEL 204 DBMS**. Recently rated #1 overall in a Datapro survey, MODEL 204 is recognized today as the most powerful and fastest growing DBMS for IBM mainframes. Recognize what we're saying. This level of professional acclaim and commercial success is the direct result of serious efforts on the part of advanced research and astute marketing sensibility. One without the other simply won't do.

Hard-nosed, self-serving rhetoric? Perhaps. But face it: it's silly to work anywhere else.

### SALES & PRODUCT SUPPORT

• **SALES** Excellent opportunities for exceptionally aggressive and creative Sr. Sales Representatives to assume responsibility for selling MODEL 204 Database Management System and related components. You'll be offering an excellent product in a rapidly expanding marketplace, with a highly incentive-oriented compensation plan with NO CAP. Positions are available in Houston, Los Angeles, Denver, Rochester, NY, New Jersey, Pittsburgh, Stamford and Hartford, CT, and Orlando, FL for professionals with a minimum of 3 years' successful experience selling IBM compatible software products. An International Sales position is also available, based in Cambridge, MA.

• **PRODUCT SUPPORT** Technical Consultants are needed to provide pre- and post-sales support for MODEL 204 DBMS. Your responsibilities will include pre-sales presentations, analysis of user requirements, benchmarks, customer training, and installation. These positions involve travel and may be based in Cambridge, New York, New Jersey, Philadelphia, Pittsburgh, Washington, DC, Dallas, Houston, Chicago, Los Angeles, and San Francisco. Requires experience in IBM Systems/Applications software, with emphasis on operating systems, database, and teleprocessing.

• **INTERNATIONAL PRODUCT SUPPORT** Key roles for talented individuals to assume direct responsibility for contributing to revenue growth and customer satisfaction through pre- and post-sales support of MODEL 204. You will participate in and direct proposal presentations, trials/benchmarks, analysis of user requirements, product installation, and customer training. Positions involve international travel, including Japan, Australia and Europe. Knowledge of database design concepts, hands-on applications experience, and marketing orientation are essential. Requires a minimum of 3-5 years' IBM Systems/Applications software background with heavy emphasis in operating systems, database (MODEL 204, IMS, IDMS, ADABAS, etc.) and TP (CICS, VTAM, TCAM, BTAM). Strong communication/presentation skills vital, foreign language skills a plus.

### DEVELOPMENT & TECHNICAL SERVICES

• **DEVELOPMENT** Challenging opportunities for energetic and creative Sr. Software Engineers to design, develop and implement "features of the future" for MODEL 204 DBMS. Requires solid experience with IBM assembly language (BAL) and systems development, as well as knowledge of IBM operating system internals.

• **CUSTOMER SUPPORT** We need polished professionals to provide technical support to customers for all MODEL 204 versions and related updates. You'll participate in design, development, and maintenance of various support tool database applications including occasional travel to customer sites to offer support and training. To succeed, you'll need a minimum of 2 years' experience in User/Customer support, with solid knowledge of DBMS, JCL, and IBM applications, or strong systems experience. Good interpersonal and communication skills are essential. BS in Engineering or Computer Science or equivalent preferred.

• **SOFTWARE QA** An exciting opportunity to get involved with developing test plans and procedures, creating test tools, and assisting the development staff in testing new releases of the world's fastest growing DBMS. You'll also participate in developing Development & Technical Services Department standards. A minimum of 1-3 years' DBMS experience is preferred, and background in a vendor environment is ideal. Software QA experience and BS/MS in Computer Science or equivalent required.

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- IBM Series/1 experience
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- IBM 4341, 3081, 3705 experience
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• Prefer experience in any of the following: VIM (SNA), TCM (SNA), MNE, CICS internal, SMP, NCCF and/or NPDA

### Programmer Analyst/Systems Analyst - Brokerage Financial Systems

- 2+ years experience
- Brokerage back office systems experience
- Data General experience desirable
- IBM Mainframe, CICS, COBOL and FORTRAN knowledge desirable
- Excellent verbal and written communications skills required
- College degree a plus

### Programmer Analyst/Systems Analyst - Communications Systems

- 2+ years experience
- Data General ASSEMBLER experience a must
- Commodities and/or ticker processing background desirable

### Consulting Services Marketing

- Strong professional sales experience required
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## COMPUTER INFORMATION SYSTEMS Faculty Positions GEORGIA STATE UNIVERSITY

Applications are invited for tenure-track Assistant, Associate, or Full Professors with teaching and research interests in Computer Information Systems for Fall Quarter, 1984. The department consists of fifteen full-time faculty members, approximately 800 information majors in the BSBA program, 120 Master's students, and 12 Ph.D. candidates. The degree programs in information systems emphasize the application of computer resources to business and organizational information systems problems, based on a curriculum designed to implement ACA 10. Computer courses include all the areas of software engineering, database management systems, and MIS.

Assistant Professors - Candidates must hold a doctorate. Associate Professors - Candidates must hold a doctorate and be eligible for the tenure track appointment (tenureless appointment). Salary is competitive.

Application Deadline: February 30, 1984

To Apply - Send Resume To:

Dr. Stanley J. Smith, Interim Chairman  
Department of Information Systems  
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University Plaza  
Atlanta, Georgia 30303  
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Your primary responsibility will be to upgrade our TYMCOM 10/20 operating system by enhancing its performance, availability, and reliability. The task requires individuals experienced in the thorough analysis, design, coding, and debugging of existing and new software.

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For immediate consideration, please send your resume and salary history, in confidence, to Tymshare, Inc. Computer Systems and Support Division, 8910 Liberty Street, Fremont, CA 94538, ATTN: John Swarbrick.

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### Systems Programmer (Genrel) -

For chemical plant, the region's largest chemical plant, we are seeking an experienced Systems Programmer with a minimum of 3 years of chemical plant experience. The position involves programming, experience with multi-user systems, and can have future advancement potential. The person should be familiar with database management and the ability of evaluating systems and future software requirements. Must be able to work successfully in a team environment. Send resume to:

Parasoft Director

1800 Joyce Street

Golden, Colorado 80403

EOE M/F/H/V

### Systems Analyst

Systems Analyst to build basic financial and forecasting models using corporate available data. Must have strong analytical skills, excellent verbal and written communication skills, and a strong knowledge of economics and corporate finance. To be the individual member of the team, conduct analysis with users, and develop models. Salary: \$35,000 per year. 40 hour week. Requirements: A Bachelor's degree to accompany about 1 year of work experience or a Master's degree in economics. Post 2 years experience in corporate financial systems. The person should be familiar with database management and the ability of evaluating systems and future software requirements. Must be able to work successfully in a team environment. Send resume to: Parasoft Director, 1800 Joyce Street, Golden, Colorado 80403. EOE M/F/H/V.

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1-3 years experience with COBOL in a Univac 1100 environment utilizing TAP-1100 and DMS-1100 personnel/performance experience preferred. Strong written and verbal communication skills required as well as proven ability to closely interface with users. System development methodology experience helpful.

### ANALYST/PROGRAMMER

Must have 3-5 years experience in the analysis, design, programming and implementation of commercial application systems in a Univac 1100 environment utilizing TAP-1100 and DMS-1100 personnel/performance experience preferred. Strong written and verbal communication skills required as well as proven ability to closely interface with users. System development methodology experience helpful.

Send resume to Karen Downey,  
P.O. Box 1348  
Kansas City, Mo. 64141  
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These openings are at our facilities in New Jersey, Ohio and Pennsylvania.

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With the development of new and expanding projects, we are seeking people who can evaluate alternative architectures, perform competitive analyses, assess service viability, define, implement and measure systems or develop strategies to get products to market.

If you have a Master's or PhD in Systems Engineering, Computer Science, Electrical Engineering, Mathematics, Physics, Statistics or Operations Research with hardware and/or software experience—or a BS in these fields with a minimum of 5 years highly relevant experience—and are looking for a chance to make a difference, please send your resume to:

Director, Technical Employment,  
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## SOFTWARE ENGINEER

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We have a current opening for a Software Engineer who will provide software support functions for large digital communications systems including communications controllers, TMDA, local switch, and telephone and data interfaces. These duties include development of test and simulation programs and device drivers, support of existing software, system testing and development of test plans and procedures.

Position requires a Bachelor's degree in Computer Science or related field; advanced degree desirable. Individual should have a minimum of 5 years' experience in real time software/hardware systems, preferably in communications related applications. Experience in microprocessor-based systems and in both high and low level programming languages is highly desirable.

We offer excellent working conditions and a complete benefits package that is one of the best in the industry. Send resume, including salary history and requirements to: Personnel Administration, American Satellite Company, 1801 Research Blvd., Rockville, MD 20850, Dept. CW-83.

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The successful candidate will have a degree in Computer Science or Mathematics, two years' Series I/ADI and one year EDI-CF experience. Excellent written and verbal skills and communication and system programming background is essential. This position will support 20+ systems and have the opportunity to develop many interactive applications for a growing international organization.

We offer a competitive compensation and benefits package. Please send your resume and salary requirements to: Corporate Personnel Manager, Westin Hotels, The Westin Building, Seattle, WA 98121. Equal Opportunity Employer M/F.



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Excellent growth opportunity. Flexible equity. Full relocation program.

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Consultants for the New York, New Jersey, Connecticut areas. If you are in India, or want to know its benefits and want to work with people you can trust contact John Douglas, Software Outsider, 45 West 27th Street, New York, NY 10001 (212) 696-9887.

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## COMPUTER RESEARCH SCIENTISTS

Battelle Columbus Division's Software Products Center, a leader in database technology, is rapidly expanding our market in IBM environments and currently has several immediate opportunities for experienced computer scientists to work in the fields of software development and database management. We need strong technical experts with 2-5 years experience on IBM systems, running VM/CMS or MVS/TSO to aid in the development and maintenance of our BASIS products (large data management systems) on IBM equipment. One to two years experience working in Assembly language using system macros is essential; experience in setting up applications to run under VTAM is highly desirable.

Battelle offers a competitive starting salary, excellent employee benefits and opportunities for career growth. These technical support roles in our Software Products Center also offer limited opportunities for domestic and foreign travel from our Columbus, Ohio headquarters. Experienced computer scientists interested in these challenging assignments should send resumes in confidence to: Staff, Employment Dept. F-4.

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• PROGRAMMERS • ENGINEERS

• SYSTEMS ANALYSTS • CONFIGURATION MANAGERS

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If you would like 2 or more years' real or microcomputer experience that involves FORTRAN, COBOL, ASSEMBLY LANGUAGE, UNIX, VAX/VMS, operating systems (PDP), submit your resume along with salary history and requirements for immediate confidential consideration to Mr. Ferguson, 1300 N. 17th Street, Suite 950, Arlington, VA 22206, (703) 278-6900.

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You will be responsible for establishing and maintaining a full production data center. This includes daily operations and user support/training, hardware installation and maintenance and a technical library. Candidates should have at least 5 years experience in IBM hardware and software systems, and 3 years experience in management. Experience with both VM/SP and MVS would be an advantage. (Dept. 2500)

### Manager/Computer Resource Planning

We are using VM/SP as our primary operating system, and MVS for certain applications. We seek a person who is familiar with both operating systems to establish a very powerful resource analysis/planning system to allow us to plan for and control our workload. You will also be responsible for spotting and correcting performance bottlenecks and usage accounting. Requires at least 8 years experience in IBM systems and 3 years experience in management. (Dept. 2600)

Accept the challenge of a top group of highly talented professionals and actively contribute your knowledge, enthusiasm and initiative. Advance your career with us. Explore our competitive salary and benefits package. Expedite your resume to Professional Employment (indicating Dept. 1, 600 Central Expressway, Santa Clara, CA 95050) IBM S&S 4800. Pre-qualified only please. We are an equal opportunity employer.



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Genesys' continued rapid growth will soon be creating additional opportunities for Field Support Specialists and Sales Representatives in other major U.S. cities. Sales opportunities are immediately available in Houston, Chicago and New York. Interested individuals are invited to reply at this time.

If you would thrive in a fast-paced, professional environment and enjoy the technical challenge of a company that introduced the Second Revolution in HRMS, please forward resume and salary requirements to: **Genesys Software Systems, Inc., 10 Madison Street, Lawrence, MA 01842.**

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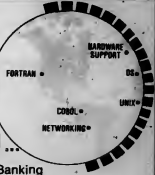
## Computer Professionals

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Perkin-Elmer has gone through a major expansion to improve support provided to our customers. Our Worldwide Technical Support Center located in Tinton Falls, New Jersey meets the demands for responsive, high quality support. With ongoing new product developments, expanding applications software and tremendous growth, our leadership position... and your career success... is assured. We have a wide range of challenging opportunities for Support Engineers with a desire for recognition and career mobility.

We're looking for SR. SOFTWARE SUPPORT ENGINEERS to provide home office technical support for our field specialists/customers both on-site and via telephone from our Worldwide Technical Support Center. SOFTWARE INSTRUCTORS to provide home office or field instruction to our engineers or customers. HARDWARE SUPPORT ENGINEERS to provide high



level product support with an emphasis on international and trade show support. If you have software experience in COBOL, FORTRAN, communications or UNIX or networking experience maintaining and repairing minicomputers, we have a world of opportunities awaiting you in the New Jersey Shore-area.

Perkin-Elmer offers excellent salaries, an outstanding fringe benefits package including profit sharing, stock purchase plan, comprehensive medical, life, and dental insurance, retirement plan, and educational assistance. We offer you unlimited advancement potential in a fast-paced high-technology environment.

If you are unable to call at the designated times, send your resume TODAY to: Human Resources, The Perkin-Elmer Corporation, 61 Davis Avenue, Neptune, N.J. 07753. An Equal Opportunity employer m/f.

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Candidates must possess strong skills in both the technical and client negotiation capabilities of MSA Software Packages. You will participate in Project Implementation Teams to analyze and implement packaged Financial Software.

To qualify you should have strong experience with MSA - AX, AP, GL, Payroll/HR, FIA, or other Packaged Financial Software. A college degree is preferred.

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**Sealed Proposal for Proposed No. 076 due 2:30 p.m., Wednesday, December 14, 1983, for the acquisition of IBM 4331 compatible terminals and printers. This is a general RFP to be used to select vendors and printers for the State of Mississippi during 1984.**

**Sealed Proposal for Proposed No. 077 due 2:30 p.m., Wednesday, December 14, 1983, for the acquisition of IBM 4331 compatible terminals and printers. This is a general RFP to be used to select vendors and printers for the State of Mississippi during 1984.**

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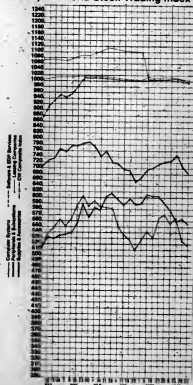
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## Computerworld Stock Trading Summary

DIVIDEND RECORD: 1982-83: 1.00

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# 15 printed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

## Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is *the* software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

## Our technical edge comes from experience

Saying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest \$25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA believes you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That eliminates a lot of the tedious work you normally have to do.)

## Save this box. It can help you make an intelligent software decision.

- Can you offer us a complete range of software systems designed to work together?  
Or will we have to piece together a patchwork of systems?
- Are your systems just record keepers, or can they really help us make decisions?  
Can we put together information from any of our integrated systems? In exactly the form we want it?
- Can you provide business software for both mainframe and microcomputers?  
Do you develop this software yourself or do you simply market it for another company?
- Are your systems truly online, current?  
How many of your systems are online? How secure are they?
- Will my company have to be the one that discovers the bugs in your brand new system?  
Just how long have your systems actually been used, and how have they been tested?
- Will you update your systems as technology advances and regulations change?  
What are some of your most recent updates? Will you keep us current on regulatory changes?
- Do your systems really do everything you say they will?  
Or will we have to change them or add to them to get the features we want?
- How long have you been in business?  
What are your revenues? What is your growth record? Where will your company be five years from now?
- How many systems has your company installed?  
How many of these were installed in the past six months? How many of your earlier customers are still using—and liking—your systems?
- Do your financial systems handle unlimited foreign currencies?  
Do your financial systems use a common set of currency exchange rates?
- Can you link our executive computers directly to the mainframe—so they can get their own information?  
Is that software available right now?
- How will you make sure our own people thoroughly understand your system?  
Do we have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?
- How many of your people specialize in software for my industry?  
How many accountants work for you? Human resource specialists? Manufacturing experts?
- Do your systems have built-in features that make them easier to use?  
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?
- As my business changes, will your system be flexible enough to change with it?  
Or will we have to pay a lot to rewrap it? Or even reprogram it?

## 35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASYSCREEN™ lets them design their own screens without creating data processing nightmares. If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

## The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data processes

ing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

## MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll be your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with

MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

## Talk to us

If we've whetted your appetite with our 15 questions, flip the coupon below.

We'll send you a concise booklet that will help you even more in your deliberations. We'd also like to send you more information on how MSA can help you plan for software. And on individual systems.

Just fill in the information below, or contact Robert Carpenter at (404) 239-2000.

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8. Order Processing	
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